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Editorials

HAPPY NEW YEAR, 1938!

For the medical profession in 1938 the New Year will be felicitous if attention is paid to the ancient Attic adage:

"Ton ponon poolousin amin panta tagatha theoi" . . . or "The gods sell us all good things for hard work."

The words came from the lips of Epicharmus. They might has been an adjuration to future disciples from Hippocrates or Aesculapius. "A Happy New Year" will be impossible to the medical profession throughout the span of time ahead *and (unless one of the most arduous tasks in history* is assumed concentratedly by doctors all over the land) the medical profession will find itself the most cheaply subsidized cog in the whole vicious communistic machine now being set up in the United States.

One of the products of this machine is to be, Heaven help us!—a political puppet physician. But since "Self-help is God's help," the medical profession should assume a definite awareness of individual effort for salvation. Immediate action as well as definite awareness is demanded. All over the United States, with this incoming year, are assemblying those bodies of men who have been elected by taxpayers all over the country to dictate the ways of government, the paths of citizenship, and the collection and the subsequent spending of the tiethes. For such tasks these electorals receive salaries and perquisites from the taxpayers who have set them in office. They are there to serve rather than destroy the men who have placed them in power, and to serve, *not* to destroy, the commonwealth. This statement would seem to be one of the commonplaces of morality and ethics.

Unfortunately, communistic action works with small respect for morals, ethics, or that unit of the commonplace ordinarily called common sense. Communism and communistic practices are divided between abstract theory and concrete destruction. Whatever is and has been must be

wrong. The great god of Everlasting Upset and Eternal Chaos is the communistic deity in chief.

For centuries the medical profession has been faithfully, sacrificingly and with increasing competency serving mankind as ably as it could. No other band of men, outside of the group wearing the ecclesiastical mantle, has attained such extensive personal and professional philanthropies. In primitive times, and even still in primitive races, the "medicine man" is regarded with respect, with reverence and with awe. For is not his the skill that bridges the chasm between life and death? In earlier civilizations the practice of medicine was restricted to the priests in the temple. There may have been—there probably was—politics in the priesthood. But be it said for those oriental servants of the temple, they managed to drive the powers of politics, rather than to be driven by them. And in that respect, if in none other, modern medicine has regressed rather than progressed.

For, at the inception of 1938, *what does the medical profession face, here in the United States?*

First of all, the appalling specter of lay bureaucratic control, politically inspired, adjudicated and dominating, bids fair to transmute itself into an inescapable tyrant of more brawn than brain. In July a bill was introduced into the United States Senate, so craftily constructed, so varied of interpretation in its seemingly innocent clauses that it may well be construed as the finest example of a "wooden horse" socialistic traitors have succeeded in introducing into the life of the American people. With this bill in effect, with the medical profession *federalized at the expense of the taxpayer,* and absolutely at the mercy of the political boss, the death of medicine as an able science and the death of Americanism as a nation, and the slow death of the people from an eventually scientifically depreciated medical service requires no gifted imagination to foresee. Added to the direness of such a bill is the catapult which will set it in action and which is being gradually erected from boundary to boundary,—the federalized units of state medicine or compulsory health insurance developing in various civilian "groups," supported indirectly, or even directly, by whole or partial taxation and of which the most arrogant first saw the light among government employes in Washington, D. C. Considering that all of these employes are directly supported by the great American taxpayer, it demands no second sight to behold in that taxpayer an individual degenerating rapidly into an oafish esne!

The question may be propounded:

"What has all this to do with the medical profession? Or with the individual physician?"

The answer is that the medical profession, like the federal funds, is composed of a group of taxpayers. The medical profession is the lamb led most avidly to the slaughter. For by this communistic theory of compulsory health insurance, lay dictated and bureaucratically controlled and tax supported state medicine, both the physician and the general public, from the standpoint of health and welfare, are literally taken in three ways—going and coming and straight in the middle!

Since this is a political war against science, decency and true Americanism, and contingently an offense against the health of the world,—since American vital statistics prove us the healthiest and best cared for nation from a medical standpoint—the weapons that must be used are political ones. There is but one effective weapon in politics. *That weapon is the ballot.* Physicians who have held themselves too pure or too professional to concern themselves with what goes on at the primaries and the polls find themselves finally confronted with the necessity for action that has been preached and repreached in these columns practically perennially for the last three decades. That is that the rights of medicine, the prerogatives of medicine, the sacred duties of medicine are right at this moment in legislative halls from Washington to the lowest hamlet being perverted into a political mop-rag . . . a mop-rag for which the medical profession and the people themselves are paying through the nose.

Yes, for increased taxes must be levied to meet the expense of paying for the bureaucratic red tape with which medical efficiency will be slowly but surely suffocated.

The task that is up to every doctor in the land is to pull the fat out of the fire insofar as he can. It is a personal and an individual duty. It is said that physicians have been so negligent as to let the wool be pulled over their eyes when candidates for every office were up for election. Since that was done, however, the work at hand is to focus on these legislative bodies now in session. STOP THE LEGISLATIVE CRIMES

BEFORE THEY ARE PLACED ON THE STATUTE BOOKS. MAKE LEGISLATORS FROM WASHINGTON TO PODUNK REALIZE THAT THEY CAN NO LONGER DECEIVE THE MEDICAL PROFESSION WITH PSEUDO-PHILANTHROPIC BUNK AND THAT BONSWOGGLING BUNK KNOWN AS "FEDERAL AID," WHICH IS ONLY A ROBIN HOOD METHOD THAT DOES *NOT* GO AROUND ROBIN HOOD'S BARN WHEN IT COMES TO MAKING THE SACRED PROFESSION AND SCIENCE OF MEDICINE A CHEAP, POLITICAL PROSTITUTE AND MEDICAL MEN POLITICAL PUPPET PHYSICIANS.

Month by month in these editorial columns your editor has cited facts and figures revealing the fallacy of engrafting the diseased economics of Europe upon our own comparatively healthy and at least youthful nation. All this dither about compulsory health insurance was the Bismarckian pill prescribed by the Old Chancellor of Blood and Iron to palliate an economic infection derived from imperial oppression and super-imperial taxation when European royalty was glimpsing its "Gotterdammerung" or "Twilight of the Gods." The most of them have since then passed to their more or less pleasant "Valhalla," or, if they have not, are probably wishing that they might have done so, long before the debacle. If such palliative measures did not cure the conditions for which they were prescribed, then how in the name of science or common sense can the same prescription be expected to cure a disease that does not exist in any other nation? The reply to this is that such an eventuation is to be expected only in the name of political chicanery—politics at its worst.

The American Medical Association has been quick to admit that some of the mechanics of the practice of medicine need revision, because the American Medical Association, being what it is and exactly what the title signifies, is an organization eager to look facts in the face, as is the way with medical men. *Fasts first, theory afterwards.* That is the tacit slogan of medicine. In truth, it may be said that *facts* are a medical passion. And the facts in the case in the eyes of the group of American medical men—the group that knows more than anyone else the truth about medical economics, the need, the use and the abuse of so-called "medical charity," the group that pays of its own flesh and blood and bone for the success of medicine as a healing art,—that group is definitely against the federally subsided, the lay-dictated, politically controlled, tax-supported, bureaucratically dominated practice of medicine in the United States now being hatched in Washington. Ask any delegate to the June, 1937, session of the A. M. A. in Atlantic City, N. J., as to his idea of the "wooden horse" fetched to the convention by the Senator from Illinois!

In the name of America, in the name of Medicine, in the name of Humanity, immediate action is demanded. Get busy, Doctor! Get busy now! Begin with your alderman and keep on going! Don't stop until you reach your representatives and your senators down in Washington, D. C. Educate them. Explain to them. Let them know what they are doing. Like the man in the traditional early American story, try a little "moral suasion." But all the while you are trying this, let 'em know, Doctor, let 'em know that in your good right hand you have the one and only weapon of which the boldest, the lowest, the cheapest politician in the cheapest sense of the word is more afraid than he is of "man, God, or the devil,—and that is the great American ballot box—*the vote at the polls.*

Do something about this. Do it today. Do it with the same spirit that you tear off the last leaf on the calendar for 1937. Enforce upon cheap politics the knowledge that the profession of medicine will live up to its tenets, its ethics and its oath and thus preserve for posterity that spirit of service and that degree of scientific efficiency through which medicine has emerged through the centuries as an almost supernatural savior of mankind. There is nothing that brings surer happiness to the human heart than the knowledge of duty well done. When medicine is rescued from the maw of politics, then, and then only, can the physicians of the nation feel that they have before them that encouragement which will make for a "Happy New Year."

The tenor of this message is analagous to every message that has been sent you for some years past. This has had to be, since the menace that sits by our side today has been rising gradually from beyond the horizon for at least a quarter of a century. To preach the warning, even if in some degree by many eyes and many ears it went unheeded, has seemed to your editor to be

his most manifest duty. However, attention to this has not in any way diverted attention from the physical side of the ILLINOIS MEDICAL JOURNAL. In format and in circulation it has ranked highly, both nationally and internationally. Its advertising has been of excellent stability throughout the worst depression in the nation's history. As to its editorial content—for which hard-working, diligent and gifted men of medicine have generously opened their hours of experience for sharing with their fellow workers—the recognized value to the medical world is only too obvious, and from the editor must receive expressions of deepest gratitude and sincerest appreciation, which undoubtedly are participated in by every scientist who reads our JOURNAL.

SENATOR KING ON REGIMENTATION

Senator King of Utah, in a speech in the Senate on December 9, 1937, said:

Regimentation is now quite fashionable in Russia, Germany, Italy, and in some other countries; but, as regimentation advances, liberty and the rights of individuals are submerged. Many people are fascinated with the idea that laws are more important than liberty, and that bureaus and powerful government agencies are necessary, even in democratic governments, to control trade and industry, and the lives and habits and activities of the people. It is somewhat singular that, with the pages of history before us, we should follow obsolete and discarded policies and introduce into our economic and industrial life policies that are an outgrowth of oppressive paternalism and autocratic rule.

THE DOCTOR OWNS THE PATIENT BY CONTRACTUAL PROPERTY RIGHT; THE PATIENT OWNS THE DOCTOR BY THE SAME RIGHT

Dr. John J. Hurley, Boston, Mass., under date of Aug. 4 in the VOICE OF THE PEOPLE of the *Chicago Tribune*, under the heading "Doctors, Patient and Government," says:

A short time ago you gave space to the speech of Senator J. Hamilton Lewis, delivered to a section of the American Medical Association. In my opinion the senator had such a complete misconception of his subject that I am kindly asking you for space that I may overtake him.

I think that without a breach of modesty or the truth I may qualify as a doctor, a lawyer, and a nationally known medico-legal economist. In any event, for thirty-five years I have been pointing out to Presidents, congressmen, governors, state legislators, sociologists, and medical editors, who ought to know better, that the doctors of the United States are not going to be required to do anything they do not want to do, at least while the Thirteenth Amendment remains in the Constitution of the United States. As the late Chief Justice Fuller so forcefully pointed out, there are certain things which cannot be brought about in the United States, under the guise of an exercise of police power, and one of them is involuntary servitude.

I think that this will make it perfectly clear to the senator that his idea of issuing a federal or state license to the doctor, contingent on his entrance into a compulsory contract—a legal monstrosity—had better die aborning.

Further, the senator seems to have forgotten the legal status of the doctor. At law, with the usual exceptions, the doctor is an "independent contractor" who feels, rightly or wrongly, that it is in the public interest at the present time to keep the government a "stranger to the contract." As long as he feels that way, a contract being a meeting of the minds between two or more persons for a consideration, there is nothing the senator can do about it.

It only remains for me to supply the proper response to the senator's unanswered question, addressed to the convention of the American Medical Association: "Where did you doctors get the idea that you owned the patient?"

Senator, the doctors got the idea from the laws of contract, the idea finally resolving itself into fact: The doctor owns the patient by contractual property right; the patient owns the doctor by the same right; the government owns neither, but on the contrary is owned by both.

THIS MAY BE THE MACHINE AGE, BUT THE PEOPLE WHO LIVE IN IT CONTINUE TO BE HUMAN BEINGS

One of the drastic complications of modern civilization in relation to the practice of medicine is the change in attitude between the physician and the patient.

The old fashioned physician was wont to treat persons. Individuals, the ailments of personal entities received the advice and attention. But

nowadays the doctors treat disease. The ailment rather than the ailing is the chief objective of the practicing physician of today. There is no quibbling over the fact that the element of the human relation is almost entirely eliminated in modern treatment of disease.

Substitution of machine for human routine is possible with profit only in the exact sciences, in which classification medicine most surely does not lie. Even in the application of the exact sciences it is impracticable to omit the human element, for any profession that omits the human element ceases to be a profession and becomes a commercial enterprise. After all, the verities and the humanities do not lie so very far apart.

That the awakening to this truth is becoming general is evidenced by the increasing insistence of the value of humanistic studies as a preparation for a professional career by heads of schools of law, medicine, dentistry, architecture and even of engineering.

There is much of interest as well as food for thought in the comment made by an octogenarian and outstanding physician, Dr. William Henry Welch. Epitomizing the impersonal automatisms of the day as meat for the critic's jaws, Dr. Welch, while approving the soundness of modern research, does not fail to remember the virtues in the older dispensation."

"One thought makes me look back with gratitude and love to the old family doctor," remarks Dr. Welch in an interview published in the *New York Times*. "The old fashioned family doctor treated people. The doctor of today treats disease. The old family doctor, though he had a long beard where germs abounded and even a spotty vest, knew his patient and in many cases the patient's family and his physical peculiarities. If medicine were an exact science I should say, 'Yes, the family doctor has outlived his generation.' But it is not, and he has not."

In this connection there is advantage in quoting from a recent editorial in *"America,"* to the effect that "A patient is something more than a sprain, and a client something that is not all tort. The physician and the lawyer must recognize this truth if they wish to exercise all the power for good inherent in a profession. That power is primarily opportunity and ability to contribute to human welfare. Otherwise they are individuals who make a living on the woes of their fellows."

There is no argument that a man who confines his interests to one angle of life alone, ignoring contingencies and tangencies of all the complexities that go to make up life, will eventually find his power in his profession as dried up and atrophied and emasculated as are his personal relations. There must be a keen understanding of the good and evil that is in man, and in individual men for a physician to be able to live up to all that his profession implies and even to what it demands.

Those white-coated machines who look upon each patient with the cut-and-dried aloofness with which an entomologist regards a new bug or a botanist a fresh sprout are lacking in the vital spark that makes a physician a great man.

The germs in the beard of the old fashioned doctor are well consigned to the limbo of forgotten things, but what needs to be raised again from the dead is the kindly, encouraging, absolutely human look on the face of the old fashioned physician that made the suffering human feel that in him lay a friend who was both willing and able to pull him through the rough places and whose presence was almost as excellent a panacea as his pills. *This may be a machine age, but the people who live in it, fortunately, continue to be human beings, and a certain amount of humanity is necessary in dealing with them.*

The old fashioned family doctor treated people. The doctor of today treats disease.

Larger doses of Diphtheria Antitoxin are apparently necessary for satisfactory therapeutic results in cases which show sensitivity to horse serum. Therapeutic results following administration of diphtheria antitoxin were distinctly less satisfactory and the incidence of complications was considerably higher in patients with immediate serum reactions. Davidsohn & Hunt, *Am. J. Dis. Child.* 52:1325, 1936.

Neurologic complications of pernicious anemia can probably be prevented if effective therapy is begun early and continued uninterruptedly. After reviewing a large series of cases the author concludes that "the attitude of therapeutic nihilism that exists in certain quarters is not justified." Needles, Wm., *Arch. Int. Med.* 58:765,

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Raynaud's disease, of seven years' standing, was successfully treated by administration of the estrogenic hormone. 450 I. U. of estrogenic substance in oil was given intramuscularly on alternate days for 7 doses and repeated one month and again two months later. Klinefelter, E. W., *Arch. Dermat. & Syph.* 34:887, 1936.

MEDICAL ECONOMICS

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The frequency with which articles are appearing in the newspapers of this country on the subject of the future conduct of the practice of medicine would be alarming except for the fact that the newspapers are presenting the entire subject so fairly. In December the Town Meeting of the Air entered the field by a presentation of the subject under three headings, Private Practice, State Medicine, and Cooperative Medicine. Although the writer of this article listened carefully to the discussion, he does not feel capable to comment on the facts presented until he has had the opportunity to read carefully the printed copies of the speeches of the evening along with the questions and answers. One thing was quite evident during the entire presentation. Many of the laity have been thinking about this subject, and as evidence of their knowledge and interest, are able to ask leading questions which are difficult of satisfactory answer by way of the radio, due to lack of sufficient time and the desire of those sponsoring the program to keep it snappy; at the same time it is interesting and authentic. The winter will probably present similar programs over other stations and every medical man should try to listen to them. The public are asking their family doctor what he thinks about the facts so presented and it is necessary for the doctor to be up on the entire subject. Failure on the part of the physician to evidence more accurate knowledge than his questioner, puts the entire medical profession in a bad light. One cannot dismiss the subject with a few unkind remarks. Such inquiry gives the family physician a fine chance to tell his friends the exact reasons why he is not in favor of a change in the manner of practicing medicine in the United States. The public will listen to him when they will not to public speakers.

Last month we referred to the latest book by Dr. Cronin, The Citadel. It has become one of the best sellers, and is being discussed everywhere. It is to be hoped that the medical profession has read it so that they can be able to discuss the message contained therein. A few weeks ago an Editorial in the *Chicago Tribune* analyzed the book and came to the sane conclusion that this book was definitely *not* favorable to State Medicine, but rather a severe indictment of the methods now so common in England and condemned both state and contract medicine. Such editorials as this are of untold value to the medical profession and coming from the editorial staff of the *Tribune* are particularly appreciated.

An article in the *London Mail* of September 30, 1937, with the heading "Family Doctor for Every Home" was of great interest to the writer. After deploring the lack of a general health policy in England, where they claim that the existing health services have grown piecemeal, the article concludes: "A system that does not provide for free and open choice of physicians, however excellent it may be from other points of view, suffers a serious handicap for which no administrative excellence can compensate." This is a far cry from the methods of State Medicine in some countries where little or no choice of physicians is allowed and is very encouraging to those of us who have been insisting that free choice of physicians is a basic requirement of any satisfactory method of practicing medicine. Evidently England is returning to that opinion rapidly after twenty-five years of experimentation.

A recent edition of the *Survey Graphic* contained an article by a Doctor Orr, graduate of a Chicago Medical School in 1935. He commends the system of England most heartily. It seemed a little unusual for a man who has had no experience in private practice and relatively little medical life to have already arrived at a definite conclusion so set that he can write authoritatively on so complicated a subject. One must wonder, whether he was so well entertained and con-

ducted that he fell into the error so common to American Diplomats and other Visitors of Europe of losing a sense of balance and forgetting what he really went over to Europe for. It will be interesting to read subsequent articles on the systems of Germany and Russia.

Nation's Business in November, 1937, contained a most excellent article from the pen of George Morris on the subject "The Taxpayer Pays the Doctor." We would recommend that all who are able to read this article do so. It presents some little known facts in a most entertaining manner.

It can be seen from the above, that papers and periodicals are full of information on the subject of medicine. We, as medical men, must read as many of them as we can in order to know more about the subject than the laity, who when interested are coming to us to know what we think about the articles. It is not enough to condemn them. We must be able to advance definite reasons for our oppositions and those reasons must be able to stand up under further questioning. Again this month, we are fortunate to have an article by Dr. C. S. Skaggs on this very subject, "Public Opinion." Dr. Skaggs recognizes the problem and presents his idea in a manner, which we feel sure you will all appreciate.

The members of this Committee wish to the members of the Illinois Medical Society a most Happy and Prosperous New Year.

E. S. Hamilton, *Chairman.*

PUBLIC OPINION

On May 25, 1937, Dean Carl Ackerman, of the Graduate School of Journalism of Columbia University, delivered an address at the annual meeting of the Medical Society of New York, on the subject of "The Doctor and Public Opinion." He began his address with this statement, "The trend of the times indicates, I think, that the future of our civilization will be determined by public opinion. If that be so, then the doctor needs public opinion as much as public opinion needs a doctor."

This statement needs our careful consideration and serious thought regardless of who made it, but coming from Dean Ackerman who draws his thoughts deeply from his depths of Wisdom and large store of Knowledge, we should all the more give attention to these words.

Public opinion. Just what is it, and from where does it come and what is used to crystallize it? What is public opinion? I think that we are in the main agreed as a people. From where it comes and how it is shaped and crystallized, is a problem yet unsolved to a degree that it can be controlled for the best interests of the many.

If civilization is to be directed and determined by public opinion there is a need for some drastic measures to be taken upon the source from which public opinion is directed or civilization is doomed to selfish interest and control which means a complete collapse, for selfishness cannot create and maintain that which is good. If we are to depend upon public opinion, we must first bring men into the knowledge of the fact that he is his brother's keeper for we cannot depend upon our modern set up of creating public opinion. William Penn said that a man's religion could not benefit himself unless it made his neighbor better. So it is of public opinion; it cannot benefit civilization unless it makes better the source from which public opinion originates.

Dean Ackerman farther stated that for one hundred and thirty years the New York Medical Society had held successful annual meetings without the necessity of doing so until recently, of considering the relationship between the doctor and public opinion. This statement carries a full measure of truth in it. In the past we met in our annual meetings for the one main purpose to advance our medical science and to share with each other the new facts we had learned, that we might return home to better serve our patients. Now, we might say that we meet to protect ourselves from public opinion. This is already hindering the advancement of medical science. There is, as far as I can see or understand, no reason why this time should be wasted in this manner if it was not for a selfish interest that is endeavoring to create a public opinion that will destroy the usefulness of medical science, and when they have destroyed it what have they to offer in its stead?

What force is behind all this? The desire for centralization of power and authority. Who is to have this authority and power? This is the crux of the whole question.

After years of advanced education which has been placed within the reach of practically everyone, we have so educated ourselves that we are no longer capable of governing ourselves but must be governed by the politician who in the main

is uneducated in that which he assumes to control. The basic principle of civilization is the individual; nowhere except in Canada is there much of a record of man being created in masses and these are females, and no doubt that this unusual birth was one by one.

America was the first to break the old established rule that the right to govern was invested in the birthright of some individual and place it in the hands of the people. Government must be for the individual and not by the individual. Government must not restrict the individual, only in wrong doing and the judgment of wrong doing must not be too restricted. Are we going to permit a public opinion to be created which says that the individual no longer has the right to the pursuit of happiness? Will we as a medical profession permit a false propaganda to create a public opinion that shall demand that we be regimentated under non-medical dictatorship?

What is socialization of activities and the centralization of authority? From what source has this selfish denial of individual rights and justice emanated? I wonder how much would be left of the material which produced this idea of government if we extracted from it how much we as a people had submitted to political discipline.

The proponents cry aloud about the wrongs of capitalism. That in this system there have been wrongs no one disputes, but what wrongs can socialization and centralization of power take out of capitalism when such a condition is only capitalism centralized under political control with all its abuses?

It is this same group who are asking for centralization of authority that are asking to control the practice of medicine. The first question that confronts us is: What are the qualifications of those who seek the control of medicine? Are they competent to judge the rights and wrongs of the practice of medicine and to correct the wrongs if this power is delegated to them? We have watched the affairs of government slowly but surely drift into the spoils system and it would take an imagination of an unusual quality to find an image of right to the masses in this system. This same family of politicians that have claimed to have the knowledge of the science of government to qualify them to administer the affairs of government have permitted to grow up in this nation of ours the greatest system of crime recorded under any recent or distant date and still permitting it to grow. We have a racketeering system equal to any. They said that they could not enforce prohibition, a part of the Constitution, and now the liquor traffic is beyond their power of control and the gambling situation is an unknown quantity to this group. Now they, with these failures, tell us to turn the practice of medicine over to them and they will make it what it should be and what the people want in medical service. The doctor can surely be excused for having a few doubts, and for asking some questions. We wonder if the money that is required to support these few errors just referred to was spent on the family toward those things needed in the home would have any effect upon lowering the sick days in the homes of our people. Sometimes a doctor sees the effects produced by a fit to free indulgence in certain kinds of drinks that causes him to have a suspicion that they may have some relation of bad health. Really is it what the doctor charges for medical service to the sick that is tearing down the financial strength of our people or the cost of producing ill health?

I wonder what might be said if the cost of medical service equalled that of liquor, gambling, racketeering, crime and the spoil system? Just these few items that our officials are supposed to control and prevent and do not, and ask for the control of medical service to save the people from the high cost of medical service, if they could in some way divert some of the money spent on these other things back to care for the poor over charged sick man what would happen? We are spending a few pennies to give people medicine free to be treated for syphilis and doing nothing to curb habits and conditions that spread the disease. Like the welfare worker who cries aloud for more poor people to welfare but not a whisper for the prevention of poverty. And so we cry aloud for more syphilitics to furnish medicine to, and reduce the cost of medical service. The doctor can't be too severely censored for asking who gets the reduction.

It has been said that there exists a public dissatisfaction with our present system of the practice of medicine and the privileges of those sick and that our present system does not fit the needs of those sick.

This is public opinion it is claimed. I do not accept this as wholly true, in fact I think that it is far more apparent than real. But let us grant it as wholly true, what caused this public opinion? From what source did it originate? How

much of the propaganda that was used to create this opinion of the public was based upon the existing facts? These are questions that are answerable. The facts are known. If public opinion has been formed relative to the practice of medicine from false facts, it is our duty to change this public opinion.

It is not easy to create a public opinion along right lines. This is due to the fact that people have become too sub-conscious and dislike those things that are essential. This has caused a radical change in the thinking of people. We must give this due consideration in determining what people are thinking about the doctor.

People are submitting themselves to be controlled by dictators which means in America that something different that has existed heretofore has occurred in the thinking of mankind, and we find a fixed state of mind which is almost beyond being changed by reason. But because the task is a hard one is no reason for us to give up.

The type of public opinion that exists today separates us from each other by a state of suspicion which causes us to form hostile groups. This adds to our difficulties.

First we must find a way to cause people to like and respect us, then they will have reason to trust us, and once the people trust us we can mold public opinion.

Closing thought: Social justice and social security cannot be bought with money.

The costs of these are beyond the intrinsic wealth of any nation. This has been recently demonstrated. These are not money questions. They are living questions. They are the products of right living as we relate ourselves one to the other. C. S. Skaggs, M. D.

ONE OUT OF EVERY FOUR ADULT PERSONS ON THE PUBLIC PAYROLL

It is claimed that 200,000 Chicagoans are on public payrool of one type or another.

Of these, 27,000 are directly employed by the city. Approximately 67,000 are on Work Progress Administration payrolls, while the 75,000 *still on relief are costing taxpayers $1,000,000* a month.

These payrollers would make up a formidable army. Their number is equivalent to the population of a fair-sized city.

Reduced to lowest terms, the ratio of payrollers to Chicagoans—men, women and children, is one to eighteen. This means that virtually every four wage earners must contribute to the support of one public servant or one ward of the state.

In addition, they are taxed for the support of an increasing prison, hospital, sanitarium and asylum population.

Fully three-fourths of those receiving public support, however, are on EMERGENCY payrolls.

It is for the voters and taxpayers, their employers, to decide how long the emergency shall last.

Payrollers, too, have votes, and doubtless will prolong the situation indefinitely, if possible. Public officials will do nothing about it so long as they can CAPITALIZE on relief.

Taxpayers must begin to look to their own interests.

Our federal tax problem has also grown topsy turvy. It has grown, today, to the point where no fewer than 175,000 government units collect United States taxes. It has grown to a point of such disorganization and confusion that it is completely inadequate to deal with anything resembling a businesslike manner.

The annual tax bill of the U. S. is now in the neighborhood of $12,000,000,000. That is almost $100.00 a year a piece for every man, woman and child in the Nation. It is almost $400.00 a piece for every head of a family. It is one-fifth of the national income. It is the biggest tax bill in the world.

Correspondence

MEDICAL CARE

East St. Louis, Ill., Dec. 4, 1937.

To the Editor: Enclosed is a copy of the letter I wrote to Dr. J. P. Peters, secretary of The Committee of Physicians, for the presentation of certain principles and proposals in the provision of medical care. CHARLES S. SKAGGS, M. D.

East St. Louis, Ill., Dec. 2, 1937.

Dr. John P. Peters,
789 Howard Ave.,
New Haven, Connecticut.

Dear Dr. Peters:

I have no reason to assume that you expected me to write you relative to this subject or any other, but since your office has mailed me the list

of proposals as set up relative to the improvement of medical care, growing out of the American Foundation of Government. I take the liberty to express at least my disagreement with the proposals as set forth.

I have the greatest admiration for the men composing the committee, but I am far from being convinced that their minds have directed the summing up of the views of those who expressed themselves in this study.

I am not convinced that these men would, in any way, lend themselves to anything that would undermine the foundation of democracy. As I review the report as published, all through it I see the expression of what is desired by a certain group and the setting aside that which does not blend with one desired purpose. I will admit that in the medical school you may progress along the course that your committee proposes and that you who are confined within these walls may and do come to the conclusion that all that are sick are deprived of good and adequate medical care, if they do not receive the service of those within this medical environment. I will admit that you may even be more honest than selfish in your approach to these conclusions, but I do not admit that you are right.

To your thought, the individual is only important in so far as he is a part of the mass of humanity. You must lose sight of the fact that only a small part of medicine is science, perhaps because you come in contact with and are concerned only with this small part.

You may deny me the right to these conclusions. In your set of principles, No. 1. That the health of the people is a direct concern of the government. This is not a fact and never can be a fact in a free country. It destroys the most sacred right the individual can ever possess. I do not refer to public health, I refer to the sick individual. Such a principle can be nothing more than the centralization of power and can only be forced by dictatorship upon the people.

The third principle refers to the economic need as an obstacle to adequate medical service. There is no economic need among the sick that denies any of them of medical service. This is only made apparent by propaganda. The absence of money in a sick man's pocket will never take from him an adequate medical service as long as the physician remains free from governmental control, but governmental red tape will withhold from him medical service of any kind or type.

I realize I have now written more than you will read. I do not want to be rude, and if I am, I apologize yet I say in all sincerity that you men are lending yourselves to the destruction of the greatest medical science and progress the world has ever known; why tear down that which is going up? If our medical science and service is not better than all the world, how can we be what we are in medical progress and health?

I thank you for the time you have given me and I express the hope that your committee will join hands with us and save a great profession from the control of the Ballot Box. Your road leads only there.

Sincerely,

CHARLES S. SKAGGS, M. D.,

Kewanee, Ill., Dec. 14, 1937.

BASKET BALL IS TOO STRENUOUS FOR CHILDREN

To the Editor: Basket-ball, as it is being played today, due to the present High School rules (College as well) is a game which is played by thousands of our boys, and under the present rules has been speeded up to such an extent that, in my opinion, it is actually dangerous.

Recently a boy in a near-by town collapsed at the close of a game and died an hour later. I witnessed a game between Rock Island and Kewanee last Friday night, which was extremely fast and at least six of the men played the entire game. There is no rhyme nor reason to the commitee on rules which are attempting to speed up the game for the pleasure of the spectators, not taking into consideration the players, and in my opinion, it is time the medical men of the state used their influence to have this matter corrected. Very truly yours,

C. PAUL WHITE,
Pres., Kewanee Board of Health.

P.S.—Enclosed is a copy of a letter I wrote to the President of our Board of Education, in protest:

December 14, 1937.

Dr. H. D. Swain, President,
Kewanee School Board,
Kewanee, Illinois.

My dear Doctor:

It has been my privilege to attend a few basket-ball games this fall and as a physician and as

President of the Kewanee Board of Health, I feel it is my duty to register a protest on the basketball game as it is played today.

Eliminating the center jump has apparently speeded up the game twenty to thirty percent, which already was fast enough for the physical health of the players.

No matter how well checked these boys are, there is bound to be some players, whose hearts will not, and can not, stand the strain and in my opinion the untoward effects will far surpass any benefit which might otherwise be gained from this game.

I trust that you will use your influence that the rules may be so changed that a boy must either be substituted at regular intervals or that more rest periods may be forced upon the players to eliminate this great danger.

C. Paul White.

THE PARABLES OF SOPHISTES, THE SEER

The Parable of the Dishonest Healers

PEORIA, ILL.

Now it came to pass that the Younger Practitioner, in the course of his diligent labours and in spite of his successes in the healing art, encountered many anxieties of spirit and thereof one brought more and more of disturbance to his soul.

Thereupon, after the harvest time, he betook himself unto Sophistes, the Seer, that mayhap he might learn from him the answer to the problem uppermost in his mind.

When he cometh to the wise one, he saith, "O, Sophistes, the Seer, learned as thou art in the ways of man and in all that pertains to the healing art, I come to thee humbly craving for thine answer to a vexatious problem that teareth my spirit even as the thorns and the briars of the wilderness teareth one's flesh."

"For half a score of comings and goings of the seasons have I laboured at the healing art among my people. I have dealt justly and uprightly with them in every right work and have given without stint the best that was mine to give. I have kept apace with newer things in healing and chirurgie by much reading and by concourse with my fellows and have gone afar to the conclaves of those who are our leaders and have sat at the feet of the learned."

"Thereby hath my learning gone on apace and somewhat of wisdom hath been bestowed upon me. In all humbleness the feeling resteth upon me that my doings have been worthy and oft-times it hath been given me to feel a pride of craft in my accomplishments."

"And now it so befalleth that there hath come into the city of my labours one, who with scant learning proclaimeth from the housetops his skill in healing. He speaketh spitefully of me and holdeth my doings up to bitter centures and uncharitable imputations. His ways are an offense unto me for he savoreth only of ignorance."

"His methods are as crude as his mouthings are brazen. He hath a girdle of coarsely woven hair which he saith cometh from the tail of a white wild ass. This he windeth about the torso of the ailing one and then he pulleth and twisteth the arms and legs of the afflicted and smiteth him with vigor from the upper to the nether spine."

"For a time this one and that one bare tales to me of these crude doings of this man of ignorance and of a perverse generation. I was not wroth and rebuked them not but smiled at their madness and folly."

"Howbeit, shortly came other tales and purporting great and marvelous cures thereby. One of the sanhedrins acclaimeth in the temple relief from an affliction of long standing and a tax gatherer goeth from household to household regaling all and sundry of the humor from which he hath been relieved by this man of magic."

"Yea, it goeth even further until now I find that many whom one calleth not ignorant and for whom I have, in bygone days, laboured diligently, are now proclaiming great and wonderful cures when this brazen man of ignorance engirdleth them with the plaited hairs from the tail of the white wild ass and smiteth them on the spine and twisted their extremities."

"He seemeth to exercise dominion over them and to entangle them with his talk. He doth deceive the very elect. His renown seemeth not to diminish or decay, but increaseth and taketh strength and he reapeth a goodly fruit thereby. Beholding all this causeth my heart to despair and gloom encompasseth my soul."

"Why, O, Wise and Learned One, should the just and proper methods of healing that have full approbation from the learned, be cast aside

and the ways of ignorance and darkness be accepted?"

Sophistes, the Seer, smiled indulgently and into his kindly gray eyes come a reminiscent look as he replied:

"My Son, it was ever thus."

"In the days of my youth there came into the village of my birth an ancient woman with sharp features and penetrating eyes. Whence she came we knew not. She garbed herself in unusual garments and about her was an air of mystery."

"Soon it becometh whispered about that she had access to occult things and witchery and had supernatural power over illness of every sort by incantations and by the giving of a brew of bitter herbs while the ailing one uttered apparently meaningless words in the manner of supplication."

"Many came to her and her fame spread far beyond the confines of our village. Not alone came the ignorant but many of those we looked upon as men of wisdom. They listened to her incantations, partook of her brew of bitter herbs and devoutly uttered the meaningless words. And many proclaimed great benefit thereby."

"I come to know her well and my mind was filled with wonderment at her doings. Later with a boldness born of youth and long acquaintance I asked her why she resorted to incantations if healing lay only in the herbs and why she gave the same brew of herbs to all regardless of the ailment and why the ailing one was required to repeat phrases that had no meaning?"

"I further told her that it had long been my ambition to enter the field of healing and by that token I had much of interest in her methods and her purported cures."

"She looked at me long and sharply and at last she spake. 'Young man, as time goeth on apace, method in the healing art changeth, but human nature changeth not one jot or tittle. If thou wouldst treat the maladies of mankind and doest so by the accepted methods of thy teachers then must thou compete with every other healer. To be spared that competition thou must insert into thine art something wholly different from the proscribed methods of thy fellows. What that be maketh but little difference, whether it be thine own incantations, or the laying on of hands, or prayer, or the giving of bitter herbs. But one thing is vital: the ill must be given some routine that they themselves must do and follow. Thereby if recovery faileth the fault is theirs and not thine, for it can always be shown that they failed in the part given them to do."

"Remember one thing,' saith she, "the credulity of man is such that it mattereth not how unseemly thy method appeareth in the eyes of the learned, there are still enough of mankind who lack balance and whose learning is but a thin coat over primal ignorance and a belief in the mysterious, that thou wilt have many flocking to thy door and thou wilt gather in many pieces of silver thereby."

"Shortly thereafter this woman departed hence and was seen no more."

Sophistes, the Seer, smiled at the Younger Practitioner. Be mindful My Son, it was ever thus and thus will it ever be, but pride of craft and a clear conscience outweigheth many pieces of silver and peace of soul and true felicity cometh only to him who dealeth justly and uprightly with his neighbor. Furthermore the days of that man who transgresseth against honesty are brief and shortly he passeth into everlasting darkness."

"Thus saith Sophistes, the Seer."

C. G. FARNUM, M. D.

THE CANNABIS TAX ACT OF 1937

Cannabis is the same as marihuana, Indian hemp, hashish. Marihuana is the Mexican term. The plant was known to the Greeks as nepenthe. Marihuana or Cannabis is dried and frequently the leaves made into cirgarettes. These cigarettes are sometimes called reefers and are also known as "Goof Butts," "Muggles," "Tea" or "Gage."

Any doctor wishing to prescribe "Cannabis" under any of its various names must procure a license to do so.

The Federal "Marihuana" act became effective October 1, 1937. As several inquiries have been received at our office from physicians relative to regulations for prescribing this drug, we have decided to reproduce the explanation prepared by the Bureau of Legal Medicine and Legislation of the American Medical Association.

FEDERAL CANNABIS REGULATIONS APPROVED*

The general requirements of the act as they relate to physicians were stated in the Organization Section of the A. M. A. Journal, September 11, pp. 31B and

*J. A. M. A., October 16, 1937, Vol. 109, No. 16, pp. 63B and 64B.

32B. Every physician who distributes, dispenses, gives away, administers or prescribes cannabis or any of its derivatives or preparations is required by the act to register with the collector of internal revenue of his collection district, obtain an official registration number and pay the required tax.

Applications for registration must be filed on form 678c, procurable from the collector of internal revenue. An inventory, in duplicate and under oath, of all cannabis and preparations thereof on hand must be filed with the application. Physicians will normally register in class 4 and be subject to a tax of $1 each year. A physician who sells or dispenses cannabis apart from the legitimate practice of his profession is liable to an additional tax of $3 a year as a dealer. If he dispenses cannabis only incidentally to the legitimate practice of his profession, he incurs no liability for the tax imposed on the dealer. A physician maintaining an office in a collection district where he is duly registered with the collector of internal revenue and where his stock of cannabis and his cannabis records are kept may, but only in the course of his professional practice, distribute, dispense, give away, administer or prescribe cannabis in other collection districts in which he lawfully engages in the practice of his profession, without incurring additional tax liability; but if he maintains an office in another collection district or even maintains two or more offices in the same collection district, he must pay a tax with respect to each office.

Hospitals, colleges, medical and dental clinics, sanatoriums and other institutions, not exempt as government institutions, are subject to the same taxes and incidental regulation as other registrants similarly dealing in or handling cannabis. When an institution is subject to tax, the head thereof or of the department wherein the cannabis is to be used must sign the application for registration. Nurses, under the regulations, are regarded as agents of the practitioners or institutions under whose direction or supervision their duties are performed. They are not permitted to register under the act nor are they permitted to be in possession of cannabis except as such agents, or as patients. Cannabis left by a physician with a nurse, to be administered during his absence, must on her discharge from the case be returned to the physician, who will account for it on his records. Any cannabis found in the possession of a nurse not at the time under the supervision of a physician will be forfeited to the government.

A physician desiring to obtain cannabis must make application on form 679a (Marihuana), to the collector of internal revenue for the district in which the physician is located for the purchase of an order form. The application must show (1) the physician's name, address and cannabis registry number, (2) the name and address of the person from whom the cannabis is to be purchased, and (3) a description of the desired cannabis and the amount to be purchased. The application must be accompanied by a certified check, cash or money order in payment of the transfer tax of $1 an ounce or fraction thereof, plus 2 cents in payment of the order form. Order forms will be prepared by the collector in triplicate. The original and duplicate will be delivered to the physician. He will deliver the original to the person from whom he purchases the cannabis and preserve his duplicate copy for two years. he triplicate will be retained by the collector. There are no exempt medicinal cannabis preparations; every preparation containing cannabis in any form and in any amount is covered by the act. Physicians must keep daily records showing the kind and quantity of cannabis dispensed or administered, the name and address of each person to whom dispensed or administered, the name and address of the person on whose authority the cannabis was dispensed or administered, and the purpose for which it was dispensed or administered. Every such record must be kept for a period of two years in such manner as to be readily accessible to inspection by investigating officers. No special record form will be furnished by the government for the use of those registered as practitioners, including hospitals and institutions, but each registrant is advised to keep records in the manner that is best calculated to enable an inspecting officer quickly to ascertain the quantity and kind of cannabis used daily. The initials of the practitioner giving directions for the administering of cannabis to a patient in a hospital should appear on the patient's record chart, or a prescription may be used, giving the name and address of the patient, the date, and the physician's signature or initials, which should be filed with the pharmacist in charge of the drug room before the cannabis leaves his charge. If, however, a prescription is used, reference to it should appear on the chart.

All prescriptions for cannabis must be dated as of and signed on the day when issued and must bear the full name and address of the patient and the name, address and cannabis registry number of the practitioner. Prescriptions should be written with ink or indelible pencil or be typewritten. If typewritten, the prescription should be of course signed by the physician. The refilling of a prescription for cannabis is prohibited by the regulations. Generally, the furnishing of cannabis pursuant to telephone advice of physician is prohibited, whether prescriptions covering such orders are subsequently received or not. In an emergency, however, a dealer may deliver cannabis through his employee or responsible agent pursuant to a telephone order, provided the employee or agent is supplied with a properly prepared prescription before delivery is made, such prescription to be turned over to the dealer and filed by him as required by law within a reasonable time after delivery. The government does not furnish prescription forms. Any form may be used, provided it is properly executed and shows the required information,

A physician who utilizes cannabis in the course of his professional practice should obtain a copy of the regulations that have been promulgated and familiarize himself with their requirements, Application for such a copy may be made to the collector of internal revenue of the collection district in which registration is to be effected.

—Journal Florida Med. Assn.

EDUCATIONAL COMMITTEE ILLINOIS STATE MEDICAL SOCIETY

December, 1937

SCIENTIFIC SERVICE:

13—Programs were arranged for Will-Grundy, Mason, Menard, Scott County (Iowa), Champaign, Jo Daviess, Fulton counties.

The first week in December a letter was sent to the officers of county societies over the signature of Doctor Berghoff, Chairman of the Scientific Service Committee, suggesting that special programs be given on PNEUMONIA. As a result of this letter a number of county societies are having these programs. The medical schools are cooperating in furnishing teams of pathologists and internists to present these programs.

SPECIAL PROGRAMS ON OBSTETRICS AND PEDIATRICS:

Through the Scientific Service Committee *13* pediatricians and obstetricians were scheduled to present programs in December. The programs given were as follows:

December 21—Jasper-Lawrence-Crawford Counties:
Dr. W. J. Dieckmann—"Forceps Delivery."
Dr. I. M. Levin—"Whooping Cough."

December 2—Coles-Cumberland Counties:
Dr. W. B. Serbin—"Repair of Obstetric Injuries."
Dr. Orville Barbour—"Infant Feeding."

December 6—Hancock County:
Dr. D. A. Horner—"Home Versus Hospital Deliveries."
Dr. George L. Drennan—"Infant Feeding."

December 23—Jefferson-Hamilton-Wayne-Franklin-Saline Counties:
Dr. Clifford Grulee—"Infant Feeding."
Dr. M. L. Blatt—"Dysentery."

December 2—Union-Perry-Jackson Counties:
Dr. J. L. Baer—"Cesarian Section."
Dr. J. H. Wallace—"Rheumatic Heart in Children."

December 2—Lee-Whiteside Counties:
Dr. W. F. Mengert (Iowa)—"Forceps."
Dr. A. D. Biggs—"The Premature Infant."

December 9—Jefferson-Hamilton-Wayne-Franklin-Saline Counties:
Dr. O. H. Schwarz (St. Louis)—"Management of Prolonged Labor."

Doctor Wightman has given the office of the Educational Committee an assistant to help with the details of these programs. The extra publicity and notices sent out as a result of this assistance has helped to increase attendance at the programs. The following summary of this publicity may be of interest:

December 21st meeting—Jasper-Crawford:
102 Notices sent to doctors.
34 Press releases.

December 2nd—Coles-Cumberland:
114 Notices to doctors.
38 Notices to newspapers.

December 6—Hancock County:
106 Notices to doctors.
35 Notices to newspapers.

December 9—Jefferson-Hamilton:
134 Notices to doctors.
33 Notices to newspapers.
Same number for December 23rd meeting.

December 2—Union-Perry:
235 Notices to doctors.
22 Press releases.

December 2—Lee-Whiteside:
135 Notices to doctors.
29 Releases to newspapers.

A series of programs is now being arranged for Iroquois and Ford Counties.

SPEAKERS BUREAU:

Twenty-three speaking appointments were filled for lay organizations.

A letter is going out to the Principals of the High Schools of the State offering programs on CANCER for high school assemblies and science groups.

SPECIAL SERVICE TO COUNTY SOCIETIES:

202 Notices sent to doctors about Effingham County meeting.
315 Notices sent to doctors about LaSalle County meeting.
88 Notices sent to doctors about Bureau County meeting.
87 Notices sent to doctors about Jefferson-Hamilton meeting.
29 News releases about Effingham County.
101 News releases about LaSalle County.
54 News releases about Vermilion County.
4 News releases about North Shore Branch.

PRESS SERVICE:

20 Monthly health columns to newspapers.
441 Health articles to Illinois newspapers.
90 Releases to Chicago newspapers.
336 Copies of the above material to downstate libraries.
196 Copies of the above material to Chicago libraries.
448 Copies of the above material to Health Chairmen of clubs.

A questionnaire was sent to the offices of County societies asking if they wished to be kept on the mailing list to receive the material. They were also requested to send in names of others they thought might find the material useful. As a result we received *84* ADDITIONAL NAMES to add to our mailing list—this group represent business men, superintendents of schools, professional men, and others.

Articles were written and approved as follows:
Fight Tuberculosis
Pneumonia Warning
Mother Nature's Mistakes
Attune to 1938
An Important Date
Motor Accidents Increasing
Skull Fractures
Great Men
Candy in the Diet
Tuberculosis Today

EXHIBITS:

The Committee has changed the Field window monthly. It is rather difficult to find material which is suitable for such a small space and which will carry a story to the public at first glance.

The Committee has been invited to prepare an exhibit for 15 feet of space at the Stevens Hotel during the Mid-Winter Dental meeting which is attended by 10,000 or more dentists from all over the world. This meeting will be held in February.

Doctor Eben J. Carey, who is Director of Medical Sciences for the Rosenwald Museum of Science and Industry in Chicago, has asked the Committee to furnish an exhibit to be located in the Department of Medical Sciences of the Museum, which will be completed during the summer.

RADIO:

Radio programs are being continued over stations WGN, WJJD and WAAF. The time we formerly had over WBBM is now given to the University of Illinois as the director of their radio work is to be responsible for all the educational programs over WBBM.

After a recent broadcast given by our Committee—Subject "Sick Headache"—requests for copies of the talk were received from 53 cities in California, Canada, Connecticut, Illinois, Indiana, Florida, Iowa, Massachusetts, Michigan, Nebraska, Ohio, Oklahoma, Texas, Wisconsin and Washington.

Respectfully submitted,

JEAN MCARTHUR.

SANGAMON COUNTY MEDICAL SOCIETY

CONVENTION COMMITTEES

COMMITTEE ON ARRANGEMENTS

Harry Otten.....General Chairman
Robert K. Campbell.....
.....President, Sangamon County Medical Society
Frank M. Davis.....
.....Secy.-Treas., Sangamon County Medical Society

Don W. Deal	John R. Neal
Samuel E. Munson	A. E. Walters

SPECIAL COMMITTEES

RECEPTION COMMITTEE

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George H. Vernon, Jr.....Vice-Chairman

O. F. Maxon	J. C. McMillen
David H. McCarthy	T. F. Hill
Henry E. Lutyens	K. J. Malmberg
W. W. Van Wormer	Thomas F. Harmon
L. D. Wright	Harvey W. Sears
J. C. Walters	J. M. Shearl

Charles McLaughlin

PRESIDENT'S DINNER

John R. Neal.....Chairman

Samuel E. Munson	Harry Otten

INFORMATION COMMITTEE

Corwin S. Mayes.....Chairman

George H. Fleischli	B. Lyman Stewart

PUBLICITY COMMITTEE

John J. McShane.....Chairman
Kenneth H. Schnepp.....Vice-Chairman

James E. Graham	Russell T. Bothe

HALL OF HEALTH COMMITTEE

A. C. Baxter.....Chairman
Loren E. Orr.....Vice-Chairman

George T. Palmer	Robert K. Campbell
H. H. Tuttle	Homer P. Macnamara

Saumel E. Munson

TRANSPORTATION COMMITTEE

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A. L. Stuttle.....Vice-Chairman

M. E. Rolens	David E. Barker
Martin B. Jelliffe	W. P. Levis

STAG ENTERTAINMENT

H. B. Henkel.....Chairman

ATTENDANCE COMMITTEE

Ralph T. Clark.....Chairman
C. W. Milligan.....Vice-Chairman

M. M. Bradley	Gerald C. Hunt
A. W. Barker	W. P. Armstrong, Sr.
Albert R. Trapp	J. C. Jackman
E. K. Lockwood	P. G. Kokenes
J. G. Meyer	H. S. Dickerman, Jr.
Thomas W. Priest	John Schilsky
H. B. Raman	Robert H. Beverly
T. G. Hill	Friedrich P. Bornstein
James M. Bell	Domenico Sterbini

Milton Levine

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.....Mrs. Y. A. Staton, Mrs. W. P. Levis
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.....Mrs. Nelson H. Chesnut, Mrs. J. A. DeFreitas
Hostesses
Mrs. L. D. Wright — Mrs. Loren E. Orr
Mrs. A. L. Stuttle — Mrs. J. R. Irwin
Mrs. H. E. Lutyens — Mrs. J. C. Walters
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Mrs. Edgar T. Blair — Mrs. A. Vass
Mrs. Friedrich P. Bornstein
Mrs. Domenico Sterbini
Mrs. Charles McLaughlin
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....Mrs. Nathan Rosen, Mrs. William J. Morginson
Hostesses
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Mrs. F. P. Cowdin — Mrs. E. L. Bernard
Mrs. R. J. Flentje — Mrs. J. C. McMillian
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Mrs. C. C. Copelan — Mrs. W. W. Van-Wormer
Mrs. D. H. McCarthy
Mrs. F. Y. Kuhlman — Mrs. Noxon Toomey

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.....Mrs. O. E. Ehrhardt, Mrs. W. P. Levis
Hostesses

Mrs. H. B. Henkel	Mrs. J. J. Donovan
Mrs. I. W. Metz	Mrs. G. W. Staben
Mrs. A. E. Walters	Mrs. John R. Neal
Mrs. J. E. Graham	Mrs. E. F. Pearson
Mrs. H. W. Sears	Mrs. G. Koehler
Mrs. G. H. Vernon, Jr.	Mrs. D. J. Lewis

Tea, Executive Mansion.....
.....Mrs. C. B. Stuart, Mrs. H. L. Metcalf
Hostesses

Mrs. H. H. Cole	Mrs. O. L. Zelle
Mrs. H. C. Blankmeyer	Mrs. Stuart Broadwell
Mrs. A. C. Baxter	Mrs. G. B. Stericker
Mrs. R. I. Bullard	Mrs. Geo. T. Palmer
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Mrs. G. J. Mautz	Mrs. T. J. Hill
Mrs. M. B. Jelliffe	Mrs. B. W. Hole
Mrs. R. F. Herndon	Mrs. F. W. Light
Mrs. K. J. Malmberg	

Dinner Dance.....Mrs. J. C. Jackman

Mrs. H. H. Southwick	Mrs. Thomas F. Harmon

HONOR ROLL FOR 1937

Counties throughout the State where the entire membership is paid in full for the current year.

1. Alexander	25. McHenry
2. Adams	26. Marion
3. Bond	27. Massac
4. Boone	28. Mason
5. Bureau	29. Menard
6. Clark	30. Mercer
7. Clay	31. Montgomery
8. Clinton	32. Peoria
9. Coles	33. Perry
10. Cumberland	34. Piatt
11. Douglas	35. Pulaski
12. Edwards	36. Randolph
13. Effingham	37. Richland
14. Ford	38. Saint Clair
15. Greene	39. Saline
16. Hamilton	40. Schuyler
17. Henderson	41. Shelby
18. Jasper	42. Tazewell
19. Jefferson	43. Wayne
20. Jersey	44. Washington
21. Johnson	45. White
22. Lawrence	46. Carroll
23. Lee	47. Woodford
24. McDonough	

EXAMINATIONS AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next examination (written and review of case histories) for Group B candidates who have filed applications will be held in various cities of the United States and Canada, on Saturday, February 5, 1938.

The general oral, clinical and pathological examinations for all candidates (Groups A and B) will be conducted by the entire Board, meeting in San Francisco, California, on June 13, and 14, 1938, immediately prior to the meeting of the American Medical Association.

Applications for admission to the June, 1938, Group A examinations must be on an official application form and filed in the Secretary's Office before April 1, 1938.

For further information and application blanks address Dr. Paul Titus, Secretary, 1015 Highland Building, Pittsburgh (6), Pa.

COMMITTEE ON MATERNAL WELFARE ILLINOIS STATE MEDICAL SOCIETY

The Council of the Illinois State Medical Society, following the procedure of numerous other states recently selected a representative from each district of the state to act on a Committee on Maternal Walfare.

The group met with Dr. Harold M. Camp on November 9 in Chicago. Organization of the group was completed. Dr. T. B. Williamson of Mt. Vernon, representative of the ninth district, was elected Chairman and Dr. John F. Carey of Joliet, representative from the eleventh district, was elected Secretary. The complete committee follows:

1st District—E. G. Quandt, Rockford, Ill.
2nd District—Joseph T. O'Neill, Ottawa, Ill.
4th District—Phebe L. Pearsall Moline, Ill.
5th District—R. R. Loar, Bloomington, Ill.
6th District—Milton E. Bitter, Quincy, Ill.
7th District—Walter D. Murfin, Decatur, Ill.
8th District—O. H. Crist, Danville, Ill.
9th District—T. B. Williamson, Mt. Vernon, Ill.
10th District—Henry G. Horstman, Murphysboro, Ill.
11th District—John F. Carey, Joliet, Ill.

Dr. Frederick H. Falls, Chairman of the Governor's Committee and Dr. Harold H. Hills of the Department of Public Health of the State of Illinois, addressed the group. They were invited to attend future meetings acting in an advisory capacity.

Headquarters of the new Committee will be located at the present quarters of the State Medical Society. It is planned to have regular quarterly meetings in Chicago.

In order that each county Medical Society may know the activity concerning Maternal Welfare and the local physicians may become more familiar with the progress, it is planned to select a local Committee in each county.

The next meeting is scheduled for January 9, at the Palmer House in Chicago, Illinois, at which time it is hoped the complete organization will have been accomplished.

FORMATION OF JOINT MATERNAL WELFARE COMMITTEE OF COOK COUNTY

Seven Cook County medical and hospital societies joined hands at a meeting at the Union League Club December 16 in order to maintain the highest possible

standards for medical and hospital care of newborn and maternity patients.

Concrete evidence of this cooperation was the formation of the Joint Maternal Welfare Committee of Cook County, which comprises two representatives from each of the following powerful medical and hospital organizations: The Chicago Gynecological Society, the Chicago Medical Society, the Chicago Board of Health, the Chicago Hospital Council, the Chicago Hospital Association, the Infant Welfare Society of Chicago, and the diocesan Catholic hospitals. This committee is continuing the work of the Maternal Welfare Committee of the Chicago Gynecological Society. The maternal and infant mortality in Chicago and Cook County has been materially reduced in the past four years. It is the hope and object of the joint committee to further reduce the number of avoidable infant and maternal deaths in Cook County.

Dr. Fred L. Adair, chief of staff of the Chicago Lying-in Hospital, was elected chairman, Dr. Edward L. Cornell was elected secretary and Arnold F. Emch, director of the Chicago Hospital Council, was appointed executive secretary to the Committee, with headquarters in the offices of the Chicago Hospital Council at 105 West Adams Street.

"Comprehensive recommendations and requirements for obstetrical practice and hospital care of maternity and newborn patients are being drafted by this Committee," said Dr. Frank Maple, secretary of the Chicago Medical Society, "and it is the intention of this Committee to back up these recommendations with the full power and support of the cooperating organizations and societies."

The Committee includes the following well-known physicians and hospital experts, Dr. Fred L. Adair, Dr. Malcolm T. MacEachern, Dr. Edward L. Cornell, Dr. Ralph A. Reis, Dr. Frank F. Maple, Dr. C. C. Rentfro, Dr. Herman N. Bundesen, Dr. Luella Nadelhoffer, Dr. Herman Smith, Dr. Joseph L. Baer, Dr. Robert J. Hawkins, J. Dewey Lutes, Clinton Smith, Herman Hensel, Rev. John W. Barrett, and Arnold F. Emch.

SAN FRANCISCO AMERICAN MEDICAL ASSOCIATION MEETING

June 13-17, 1938

Members should write today if they contemplate attending the American Medical Association meeting in San Francisco this June and obtain their hotel reservations. See recent issues of the Journal of the American Medical Association giving list of San Francisco hotels and rates. Send in your requests to Doctor Frederick C. Warnshuis, 450 Sutter Street, San Francisco, California, giving names of members of your party, type of accommodations desired, rates, date of arrival and departure.

The San Francisco Session promises to be an outstanding one by reason of the scientific program, scientific and technical exhibits and the social functions. In addition there is the lure of California with its scenic beauty, majestic mountains, fertile valleys and historical background. An opportunity presents to combine profit of the program with the pleasures of visiting San Francisco, the Golden Gate City with the two bridges, engineering wonders of the world.

Come by train, boat, auto or plane—no matter how—but come. Your visit will ever be one of pleasant memory. San Francisco and the bay area medical profession anticipate the pleasure of being your hosts and cordially invite you to come to the San Francisco Meeting.

Watch the Journal of the American Medical Association for program features and events.

1938 AMERICAN MEDICAL ASSOCIATION MEETING—SAN FRANCISCO

When San Francisco was selected as the host city for the 1938 Annual Session of The American Medical Association, the profession of this Golden Gate Metropolis promptly initiated plans for the comfort, pleasure and entertainment of all who come to that national meeting. A local executive committee on arrangements composed of five members with Doctor Howard Morrow as General Chairman and Doctor Frederick C. Warnshuis as General Secretary, and eighteen subcommittees have been busy since July in developing plans and local arrangement details. Their objectives are the biggest, best, and most memorable annual session in the history of the American Medical Association.

Atlantic City, Kansas City, Cleveland, Detroit, with their known facilities and attractions have been host cities in recent years, and have justified their selection as meeting places. However, and without disparagement, none of them possess the background, the setting, the resources, the history and romance, or the facilities that are found in San Francisco and in the great state of California—the Golden Bear Empire of the Pacific Coast. To reveal these, to extend California's and San Francisco's noted hospitality, and to cause those who plan to attend the 1938 session to experience ten days of profit and pleasure midst the environs of the annual meeting city, is the goal toward which the local profession is pointing.

The Local Committee on Arrangements cordially invites the profession of the country to be San Francisco's guests this coming June. Decide now to attend the 1938 American Medical Association Meeting and plan accordingly. During the coming months an insight to some of the feature functions will be disclosed, but the final details and program of events will not be revealed until you arrive. You will long regret it if you fail to attend the coming national meeting. Talk it over tonight with the good wife and your professional associates, and join the party of your state members that is coming to San Francisco—June 12 to 17, 1938.

AMERICAN MEDICAL GOLFING ASSOCIATION MEETING AT SAN FRANCISCO

The American Medical Golfing Association's Twenty-Fourth Annual Golf Tournament will be held in San Francisco, California, on Monday, June 13, 1938, at

the San Francisco Golf and Country Club.

The San Francisco Golf Committee, appointed by General Chairman Howard Morrow, is composed of James W. Morgan, Chairman, Ernest D. Chipman, George A. Gray, George McClure, and William G. Moore. Drs. James Eaves and Walter Schaller, past presidents of the A. M. G. A., are Honorary Members of the committee.

A "Golfers Special" to the A. M. A. Meeting is being sponsored by the American Medical Golfing Association. Six games of golf have been arranged on the trip to the Coast, in New Orleans, Houston, Galveston, San Antonio, Los Angeles and Del Monte; and three on the return journey through Portland, Seattle, Vancouver, Lake Louise and Banff.

Non-golfers as well as golfers, and their ladies, are welcome on the "Golfers Special."

For full particulars on the A. M. G. A. Tournament or the "Golfers Special," write the President of the A. M. G. A., Dr. Walt P. Conaway, 1723 Pacific Avenue, Atlantic City, New Jersey; or Bill Burns, Executive Secretary, 2020 Olds Tower, Lansing, Michigan.

SOCIAL HYGIENE DAY

National Social Hygiene Day, the second observance of which has been set for February 2, 1938, by the American Social Hygiene Association, marks the high point in the year round effort to gain popular interest and support for the activities of the health authorities and the medical profession in dealing with syphilis and gonorrhea. Interested official and voluntary agencies concentrate their efforts at this time on giving the subject the widest possible publicity, by arranging for meetings of interested groups, press stories and comment, appropriate radio broadcasts, and the like.

The first National Social Hygiene Day, February 3, 1937, was an immediate success in accomplishing its purpose: it was marked by hundreds of meetings held throughout the country. More than a thousand newspaper clippings coming from all parts of the country testify to its uniformly favorable press.

"Stamp Out Syphilis — Enemy of Youth" is the slogan for the 1938 Social Hygiene Day meetings. Particular emphasis will be laid on the control of syphilis among the twenty to thirty year age group, in which more than half of all new infections occur.

Suggestions for meetings and practical community programs may be obtained from the American Social Hygiene Association, 50 West 50th Street, New York City. The Association will be glad to supply interested persons and groups with materials, such as exhibits, films, and literature.

INTERNATIONAL MEDICAL POSTGRADUATE COURSES IN BERLIN

In spring of 1938, the following international medical postgraduate courses are prospected:

1. Constitutional pathology and clinical medicine. At: I. Medical University Clinic of the "Charité." (From 21st to 26th February.) Fee: 50,--RM.

2. Frequent mistakes in the diagnosis and treatment of internal diseases and their avoidance. Taking place at: II. Medical University Clinic of the "Charité." (From 28th February to 5th March.) Fee 50,--RM.

3. Postgraduate course on nourishment for healthy and sick. (From 7th to 12th March.) Fee: 50,--RM.

4. Course on tuberculosis. At: Berlin Municipal Hospital for Tuberculosis. (From 14th to 19th March.) Fee: 50,--RM.

5. Postgraduate course in diseases of the ear, nose and throat in the University Clinic for Diseases of the Ear, Nose and Throat to the "Charité." (From 28th February to 12th March.) 150,-- and 100,--RM respectively.

6. Postgraduate course for surgeons in the Chirurgical University Clinic of the "Charité." (From 25th to 30th April.) Fee: 70,--RM.

7. Postgraduate course for oculists in the University Ocular Clinic. (From 21st to 26th March.) Fee: 75,--RM.

8. Recent results in the field of the ray-therapy. (From 2nd to 7th May.) Fee: 60,--RM.

9. Propaedeutic respectively additional training course in homeopathy. (From 25th April to 21st May.) The course is divided into two parts. The fee for part one is 25,--RM; for both parts together 75,--RM. Part two can be taken independently from part one at a fee of 50,--RM; for assistant doctors 15,--, 40,-- and 30,--RM respectively.

10. Special courses in all branches of medicine with practical work at the bedside and in the laboratory, to be held every month. For these courses participants are requested to communicate their wishes in order to find a complete program on their arrival.

Courses 1 to 9 will be held in German, and the special courses also in foreign languages.

For programmes and further information apply to the Geschäftsstelle der Berliner Akademie für ärztliche Fortbildung, Berlin, NW 7, Robert-Koch-Platz 7 (Kaiserin Friedrich-Haus).

Foreign doctors and German doctors resident abroad are granted a reduction of fare of 60% on the German Railways Company's lines; a foreign doctor can reduce the cost of his stay considerably by utilizing what are called "registered marks"; it is advisable to arrange matters with the local bank before starting.

ANTI-FILLED MILK LAW UPHELD BY U. S. APPELLATE COURT

The United States Circuit Court of Appeals, Seventh Circuit, sitting at Chicago, in an unanimous opinion, filed December 2, upheld as constitutional the Federal Anti-Filled Milk Act. At the same time the Court upheld the decision of Federal District Judge Holly dismissing the suit of the Carolene Products Company against the Evaporated Milk Association and its officers, charging conspiracy to restrain the Carolene Company from shipping filled milk in interstate commerce.

This is an important victory in the fight against this

grave menace to the dairy industry—the substitution of cocoanut oil for butter fat in dairy products. This decision undoubtedly will have a far reaching effect in sustaining all existing and future filled milk laws.

Three Federal Judges ruled that since the Carolene Company is admittedly engaged in interstate commerce in filled milk, which is skim milk mixed with cocoanut oil, in direct violation of the federal law, the essential question was the constitutionality of the Act. This being established, the manufacturers of "Carolene" and "Milnut" came into court as law violators and not entitled to relief in the courts.

Filled milk is prepared by extracting butter fat from milk and replacing it with cocoanut oil—a substance produced by cheap oriental labor. The forced sale of the extracted butter fat serves to demoralize the butter and cream markets, thus depressing the prices paid to farmers for their milk. As another unfortunate economic consequence the farmer is forced to a lower standard of care in producing and handling milk, again affecting adversely the consumer interest.

NAVY MEDICAL CORPS EXAMINATION

An examination of candidates for appointment as Lieutenant (junior grade), in the Medical Corps of the Navy, will be held at all Naval Hospitals in the United States and at the Naval Medical School, Washington, D. C., beginning May 16, 1938.

Candidates for admission must be between the ages of twenty-one and thirty-two years at time of appointment, graduates of Class "A" medical schools, and have completed an internship of one year in a hospital accredited for interns by the American Medical Association and the American College of Surgeons.

Those who are interested should write the Surgeon General, U. S. Navy, Bureau of Medicine and Surgery, Navy Department, Washington, D. C., for further information in regard to the examination and the procedure to follow for them to appear before one of the Examining Boards.

A RECENT RELEASE FROM THE PARKE DAVIS COMPANY LABORATORY CONTAINED THE FOLLOWING VALUABLE INFORMATION

In the past epidemic cerebrospinal meningitis has regularly been fatal in from one-third to one-half of those attacked; in some epidemics the death rate has been even higher. In this dread disease a reduction of mortality rate to 6.3 per cent, in face of an epidemic characterized by fulminating infections, is a remarkable achievement.

In the spring of 1936, an epidemic of meningitis broke out in the mining town of Lynch, Kentucky. The report of Petty (Kentucky M. J. 35:180, 1937) on the handling of this epidemic in a community of approximately 10,000 persons will be of interest to all physicians. By rigid quarantine of exposed cases and the ferreting out and isolation of carriers, the epidemic was brought under control; by early diagnosis and use of Meningococcus Antitoxin the astounding mortality rate of 6.3 per cent was achieved. Ninety-five cases occurred in the town of Lynch; only six of these died. Thirteen cases occurring in the surrounding country, and brought into Lynch for treatment, did not have the benefit of early diagnosis and antitoxin treatment. The mortality rate in this group was 38.4 per cent. In each of the 108 cases, diagnosis was made tentatively on the finding of a cloudy spinal fluid under increased pressure; diagnoses were subsequently confirmed by culture of the spinal fluid.

Original clinical tests of meningococcus antitoxin were performed in the Cook County Hospital, Chicago, by Dr. Archibald L. Hoyne. In several reports (J. A. M. A. 104:980, 1935, Arch. Pediat. 53:164, 1936, Illinois Med. J. 68:307, 1936, J. A. M. A. 107:478, 1936, Nebraska S. M. J. 21:321, 1936) Hoyne showed clearly that use of Meningococcus Antitoxin had more than halved the mortality in meningococcic meningitis; in one series of 31 patients treated solely by the intravenous route, mortality rate was 6.4 per cent, a figure which contrasts very favorably with the previous 19-year mortality rate of 50.6 per cent.

Clyde and Neely report (Alabama M. A. J. 6:227, 1937) that from January to June, 1936, twenty-one cases of epidemic cerebrospinal meningitis were reported in Jefferson County, Alabama. Ten of these patients received Meningococcus Antitoxin with recovery in all cases. Details of treatment in the remaining eleven cases are not known, but the mortality rate of 72.7 per cent (eight deaths) is eloquent of the inadequacy of whatever treatment was given. Of the ten patients who recovered, one had residual deafness and one was partially deaf. No other complications were observed and no serious reactions to antitoxin therapy appeared. Seven cases had serum sickness. As a result of their experience, Clyde and Neely state that all future cases of meningococcic meningitis will receive all antitoxin injections intravenously and that lumbar puncture will be performed only for diagnosis and relief of increased intracranial pressure.

Many authors, including Platou (J. Lancet 56:283, 1936), Karel (Northwest Med. 35:48, 1936), Levinson (Mississippi Doctor 14:9, 1936), Tucker (Illinois M.J. 71:328, 1937), Webb (Tri-State M.J. 9:1994, 1937), Brocklebank (Brit. M.J. 3981:857, 1937) Hodges and Shields (Kentucky M.J. 35:464, 1937) and others, give clinical proof of the effectiveness of this outstanding advance in the field of serotherapy.

STRETCHING THE TRUTH

A fisherman got such a reputation for stretching the truth that he bought a pair of scales and insisted on weighing every fish he caught, in the presence of a witness.

One day a doctor borrowed the fisherman's scales to weigh a new-born baby. The baby weighed 47 pounds.

ULTRA-violet rays help form Vitamin D, and exert a beneficial effect on the health. Sunshine is best, but in winter, the quartz lamp is a good substitute, never equalling sunshine itself.

Original Articles

VALUE AND LIMITATIONS OF ENCEPHALOGRAPHY IN CHILDREN

ABRAHAM LEVINSON, M. D.

Assistant Professor of Pediatrics, Northwestern University Medical School; Attending Pediatrician, Children's Hospital of the Cook County Hospital; Attending Pediatrician, Sarah Morris Hospital for Children of the Michael Reese Hospital; Attending Pediatrician, Mount Sinai Hospital.

CHICAGO

Encephalography is the visualization of the brain by x-ray following the injection of air or other gases into the lumbar subarachnoid space.

If someone had predicted even as late as the beginning of the 19th century that the brain could be visualized he would have been considered either insane or a miracle man. This feat, however, has been accomplished thanks to the work of Cotugno who discovered cerebrospinal fluid, of Quincke who described spinal puncture, of Roentgen who discovered x-ray and finally of Dandy who described encephalography. The method has now been in use long enough to stop and think not only of its usefulness but also of its limitations.

Indications. Encephalography is done mainly for diagnostic purposes to determine the presence of a fixed brain lesion such as hydrocephalus, cortical atrophy or new growth. It is thus indicated in the following cases:

1. Mental retardation with or without paralysis believed to be due to (a) intracranial hemorrhage at birth, (b) cerebral agenesis, (c) encephalitis.

2. Chronic convulsions due to the above causes or to epilepsy.

3. Neurologic symptoms due to brain tumor. Encephalography in these cases may furnish not only diagnostic information but also prognostic, namely as to whether it is worth while to treat the patient or whether his condition is hopeless.

Encephalography has also been used for therapeutic purposes to facilitate drainage in acute meningitis and to break up adhesions in cases of Little's disease, chronic meningitis and epilepsy. It should be remembered, however, that encephalography is a surgical procedure and should be done only when absolutely necessary.

With very few exceptions, encephalography is preferable to ventriculography mainly because of the high mortality following ventriculography.

Contraindications. The most important contraindications to encephalography are (a) brain tumor in the posterior fossa, as there is a possibility of herniation of the brain with pressure on the medulla, (b) a very high cerebrospinal fluid pressure in patients suffering from chronic brain disturbances, if the pressure cannot be brought down to normal by removal of cerebrospinal fluid, (c) an active infection anywhere in the body. It is particularly dangerous to do encephalography if the child has pneumonia, bronchitis or asthma.

At all times one must keep in mind the technical difficulties, the possibility of untoward symptoms and the difficulty of interpreting the x-ray plates.

Preparation of the Patient. I have made it a rule not to do an encephalography unless an x-ray of the skull has been taken, spinal and blood Wassermann or Kahn done, and eyegrounds examined. This has saved me a good deal of difficulty, particularly in connection with the interpretation. I also have the urine examined the day before and have the patient get an enema the night before and the morning of the encephalography. The latter is done when avertin is used.

I have also made it a rule to get an operative permit on all cases as I consider encephalography an important surgical procedure.

Technical Considerations. Attempts have been made to standardize the technic of encephalography. As yet, however, there is no standard technic.

Special apparati have been described for the introduction of air. An apparatus whereby each drop of cerebrospinal fluid is replaced by a drop of air would be ideal, but does not always work well.

A double lumbar puncture whereby the air is introduced in the upper needle and the fluid drops from the lower needle, is employed by some workers. The simplest way, however, is the use of a single needle, a three-way stopcock and a syringe. No special chair is necessary for encephalography in children.

From the Children's Hospital of the Cook County Hospital and from the Sarah Morris Hospital for Children of the Michael Reese Hospital.

Read before the Section on Radiology of the Illinois State Medical Society, May 18, 1937.

Numerous anesthetics have been used, ranging from morphin to avertin. I have used avertin in most of my cases, in doses of 80 to 100 mg. per kilo of body weight. Occasionally when the patient is idiotic I do it without an anesthetic.

Various gases such as oxygen, helium, ethylene and ether have been injected intraspinally for the visualization of the brain. Air still remains the easiest and cheapest gas to inject. The amount of air or other gas to be injected naturally depends upon the amount of cerebrospinal fluid one is able to remove. At times, as much as 200 cc. of fluid may be removed. As a rule, however, 75 to 100 cc. suffice for good visualization of the brain. In one case I obtained good encephalograms with 38 cc. of air.

I usually start the encephalography with the patient in the recumbent posture and measure the initial pressure with the manometer. After withdrawing 15 to 20 cc. of fluid I take the pressure again, then sit the patient up and take another pressure reading. The amount of air injected is a little less than the amount of cerebrospinal fluid removed. The air is introduced at no higher pressure than the original spinal pressure. I regulate that by a three-way stopcock with the pressure apparatus connected to one arm and the needle to the other arm of the stopcock. The head is shaken forward and backward and from side to side every time air is injected. If the cerebrospinal fluid becomes bloody, the encephalography is discontinued.

Plates are taken immediately after completion of encephalography and are repeated twenty-four hours later. I found that 24-hour plates are of great value as sometimes the accumulation of air is best shown at that time. The x-ray plates are taken first with the patient in the recumbent posture and then in the sitting position, four views being taken in each position: antero-posterior, postero-anterior, and two lateral.

Examination of the cerebrospinal fluid for cell count, Wassermann and Pandy suffice for clinical purposes. Cohn and I have studied the different portions of the encephalographic fluid, a report of which will appear in a separate communication.

Every one of our patients gets 300 to 500 cc. of normal saline by hypodermoclysis 2 to 3 hours following the encephalography. This is done to combat the dehydration resulting from the removal of the cerebrospinal fluid. An enema following the x-ray in order to wash away all unabsorbed avertin we believe to be useful. Urine is examined the next day for red blood cells.

Untoward Symptoms. We have been fortunate in that no death occurred in any of our cases either immediately or even within 24 hours after the operation. One patient died two days later, but whether the death was due to encephalography is problematic. We have, however, encountered some untoward symptoms.

Vomiting was rather frequent during or after the encephalography.

Headache at times occurred at the beginning of the injection of air, as evidenced by an outcry even when the patient was under anesthesia.

Collapse occurred, evidenced by shallow respiration, sweating and slow pulse; the pulse dropping to 50, or even to 40 beats per minute and becoming irregular.

Elevation of temperature was the rule rather than the exception, the temperature often rising as high as 103.

Rigidity of the neck and other meningeal symptoms also occurred, within 10 to 24 hours after the encephalography.

One patient had an asthmatic attack during the encephalography and required adrenalin.

The urine at times contained red blood cells on the day following the encephalography.

The untoward symptoms usually disappear in 24 to 48 hours, and require no treatment. Collapse should be treated by caffeine. If the headache is severe, it may be relieved by removing some of the air.

Interpretation. The interpretation of the encephalogram is no easy matter. It is often hard to decide between improper technic, faulty filling of the ventricles and existing pathology. Subdural air is sometimes a misleading factor. Insufficient air is a frequent reason for the difficulty.

The first requisite for proper interpretation is a knowledge of the ventricular and subarachnoid system including the basal cisterna. In the anterio-posterior view a normal encephalogram usually shows the lateral ventricles equal on both sides and of butterfly appearance. The third ventricle can be visualized as a narrow slit. The aqueduct of Sylvius can be visualized as a straight line and the fourth ventricle is diamond shaped. In the lateral view, the lateral ventricles

are easily visualized, the third and fourth somewhat less distinctly. The cortical subarachnoid spaces appear as pencil marking. The basal cisterna are visualized but are very small.

The changes most frequently seen in children are:

1. Dilatation of the ventricles. This occurs in practically all fixed brain lesions. The dilatation varies with the amount of obstruction to the circulation of the c. s. f. In congenital hydrocephalus the ventricles are enormously dilated. In acute meningitis and encephalitis the ventricles are greatly dilated. In other fixed brain lesions the dilatation is usually moderate.

2. Dilatation of basal cisterna. When the primary cortical pathways are blocked, damming back of the cerebrospinal fluid into the large basal cisterns occurs. Thus there may be a dilatation of the cisterna vena magna cerebri or of the cistern of the longitudinal sulcus, as well as of the pathways along the posterior half of the hemisphere.

3. Deformity of one ventricle, due to tumor.

4. Accumulation of air in subarachnoid space. This occurs when there is cortical atrophy due to any cause. It may be generalized or sacculated.

5. Obliteration of part or of all the subarachnoid space. This occurs in chronic arachnoiditis and in meningitis.

Changes in Various Pathological Conditions. In cerebral birth trauma there is a dilatation of the ventricles and large quantities of air in the subarachnoid space, indicating localized cortical atrophy. (Figs. 1 and 2.) Sometimes there are worm-like air spaces in the cortex connected with the subarachnoid air. This we believe speaks for porencephaly.

In cerebral agenesis there is a dilatation of the ventricles and wide subarachnoid markings It is not always easy to differentiate between cerebral birth trauma and cerebral agenesis. As a rule, however, localized subarachnoid air pockets speak for cerebral birth trauma.

In acute encephalitis there is dilatation of ventricles and very little air in the subarachnoid space. In chronic encephalitis or post-encephalitis there is cortical atrophy as indicated by widened subarachnoid spaces. The atrophy is usually diffuse, although some parts may be more atrophied than others. (Fig. 3.)

In epilepsy the changes vary according to the original cause. If due to cerebral birth trauma, cerebral agenesis or encephalitis the changes are those of the original disease. In idiopathic epilepsy the encephalogram is usually negative. At times, however, there is a dilatation of basal cisterna and occasional widening of subarachnoid spaces.

In brain tumor adjacent to the ventricles there may be a compression or deformity of one ventricle. In some cases there is a dilatation of

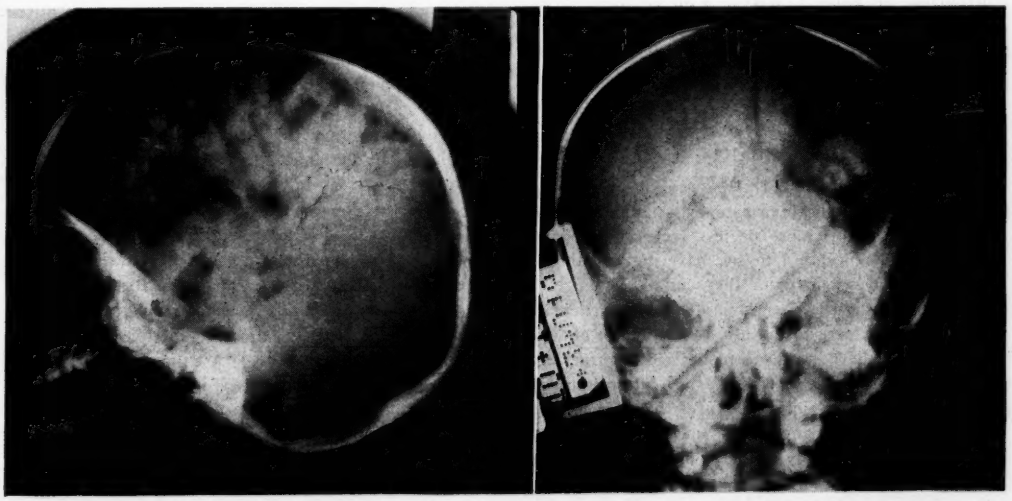

Fig. 1 (left) H. F., 15 months. Little's Disease. 46 cc. fluid removed, 38 cc. air injected. Marked cortical atrophy.

Fig. 2 (right) A. Same patient. P. A. view, showing left cortical atrophy.

Fig. 3 (left) R. G., 14 months. Post encephalitis. 119 cc. fluid removed, 110 cc. air injected. Dilatation of all ventricles and marked cortical atrophy.

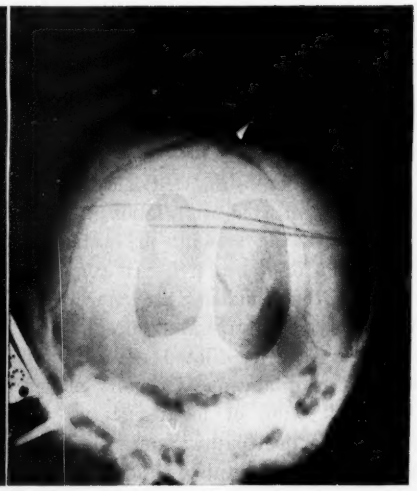

Fig. 4 (right) M. W., 18 months. Tuberculous meningitis. 150 cc. fluid removed, 140 cc. air injected. Marked dilatation of lateral ventricles.

the basal cisterna. If the tumor is not close to the ventricles or basal cisterna and if it does not cause any obstruction to the cerebrospinal pathways the encephalogram is entirely negative.

In arachnoiditis there is partial or complete obliteration of subarachnoid spaces due to adhesions.

In acute meningitis there is a marked dilatation of the ventricles varying with the stage of the disease. (Fig. 4.) This bears out the original contention of Robert Whyte who termed tuberculous meningitis acute dropsy of the brain. There is usually also an obliteration of the subarachnoid spaces due to the edema of the brain.

30 N. Michigan Ave.

DISCUSSION

F. H. Maurer (Peorial, Ill.): I came here as rather a student seeking some information as to the indication for and uses of this more or less recent development as an aid to diagnosis. I myself have not had the opportunity to do so many of these in my practice. I was glad to hear Dr. Levinson point out particularly the necessity for care in the use of this means of diagnosis, and I believe he also emphasized the fact that spinal punctures were not always of an insignificant nature. I believe spinal punctures have been done rather freely and many times uncontraindicated. I was pleased particularly to have him emphasize the fact that the doing of a spinal puncture without knowledge of the location of the tumor was a dangerous procedure.

I believe with the points Dr. Levinson has emphasized in the modus operandi of carrying this on we can go forward and use this means of diagnosis with much more ease and adapt it to our cases and get a good deal more information than we have had in the past.

M. A. Perlstein (Chicago): After hearing Dr. Levinson's paper, one might think encephalography a simple procedure, but when one attempts it, he finds a number of technical difficulties which have not been mentioned.

Among the indications for encephalography must be included the post-traumatic lesions resulting in epilepsies and psychoses. These do not occur very often in children but are probably the most frequent indication for encephalography in adults.

The technique of taking the plates has not yet been standardized. When taking plates with the patient in a horizontal position, it is usual to place the head over the plate, and the tube over the head, shooting from above. Let us say the patient is lying on the right side. By the above-mentioned technique we obtain a good picture of the right ventricle, whereas most of the air has risen to the left ventricle. It seems to me that if we wanted to get ideal plates, the plate should be placed over the child's head and the tube below so as to get a good delineation of that ventricle which contains most of the air.

In comparing plates taken immediately after encephalography with those taken 24 hours later, I have observed that the lateral ventricles appeared more distended with air in the latter. I have never been able to explain this observation.

The procedure of encephalography is rapidly becoming one of the diagnostic procedures in the armamentarium of the progressive pediatrician.

BRONCHOSCOPY IN BRONCHIAL ASTHMA

ALBERT H. ANDREWS, JR., M. D.

CHICAGO

The value of bronchoscopy in bronchial asthma is threefold: Namely, first diagnostic, second aspiration of secretion for vaccines, and third, therapeutic. Casselberry, Friedberg, Boot, McGinnis and Winters have discussed the diagnostic and vaccine value of bronchoscopy before this society, but Winters has been the only one to mention its therapeutic value.

The term bronchial asthma at least for the purpose of this paper does not include asthma as a complication of other diseases such as cardiac or cardiovascular renal diseases, but it does include asthmatic bronchitis when that term is used to denote asthma associated with an acute or chronic bronchitis.

Bronchoscopy is of diagnostic value in bronchial asthma because it is a means toward diagnosing the type of tracheobronchial changes and in differentiating asthma from other conditions. The asthmatoid wheeze may be produced by any bronchial obstruction as Jackson has demonstrated, and therefore great care is necessary to prevent the diagnosis of bronchial asthma when the condition is some other disease in such a stage that an asthmatoid wheeze is produced. The nature of such a wheeze is usually revealed by a thorough history and physical and laboratory examination, however, there will still be found patients with an asthmatic syndrome but not a characteristic bronchial asthma and it is in this type of case that diagnostic bronchoscopy is of particular value. In children bronchoscopy is of even greater value because of the always present possibility of a foreign body. Jackson has reported 38 cases of foreign bodies in the air and food passages which had been erroneously diagnosed as bronchial asthma. A number of cases of bronchiogenic carcinoma present asthmatoid symptoms and here again the bronchoscope and biopsy stand supreme in the earlier diagnosis.

The value of bronchoscopic aspiration vaccines has been demonstrated repeatedly to be superior to sputum vaccines. The reason for this is probably due to the lack of oral contamination and the more accurate determination of the predominating pathogenic organisms. In babies and younger children it is practically impossible to obtain an adequate specimen of sputum, so bronchoscopy is particularly applicable. Van Loon has recently reported a series of 18 cases of bronchial asthma in children from 3 to 12 years of age treated bronchoscopically. All of the cases were associated at the onset with a respiratory infection or acute exanthemata. One was unimproved, four were almost cured and seven were symptomatically cured with no recurrence. Van Loon considers the use of bronchoscopic vaccines to be essential for the ultimate symptomatic relief. Asthma in childhood is a difficult therapeutic problem and especially so in that type which is sometimes called asthmatic bronchitis and is characterized by recurrent at-

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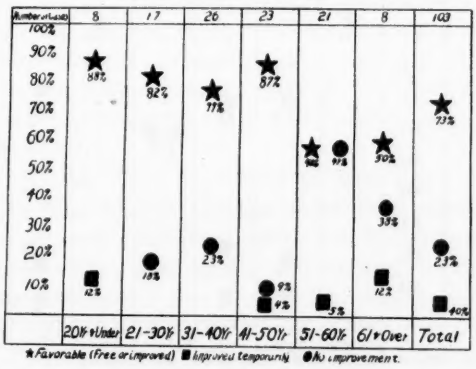

Chart 1.

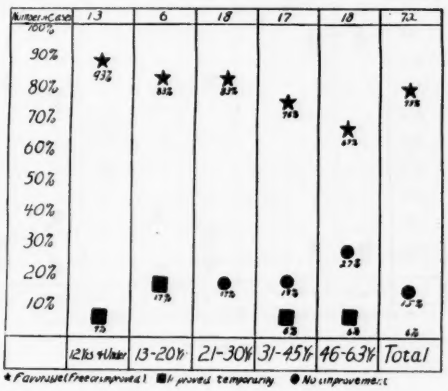

Chart 2.

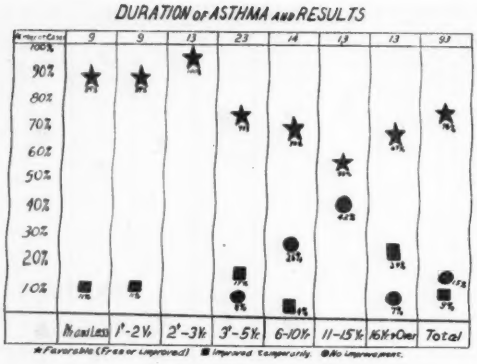

Chart 3.

tacks of wheezy respiration and fever with an acute respiratory infection. This is the type of asthma which would be expected to respond well to vaccine therapy.

Bronchoscopic Findings. The most characteristic bronchoscopic finding in bronchial asthma is a bronchitis. In the literature only one out of 399 cases was reported as having a normal tracheobronchial tree. During an acute attack the mucosa is usually rather pale and swollen with an edematous appearance, although it may be reddened or cyanotic. The bronchoscopic appearance between attacks varies and can be divided into four general types. First, slightly reddened mucosa with a small amount of secretion. This may be termed a minimal tracheobronchitis. Second, angry, dark red mucosa sometimes appearing cyanotic and with a velvety appearance and a small amount of non-purulent secretion,—a chonic catarrhal tracheobronchitis. Third, red somewhat thickened mucosa with purulent secretion, a suppurative tracheobronchitis. Fourth, a bronchitis with secretion difficult of removal by cough or ciliary action because of its character. The secretion is thick, adherent, groummous, tenacious, or large in amount, etc. This type may include cases which are classed as a catarrhal or suppurative tracheobronchitis, but it is of sufficient importance, as will be brought out later, to be considered as a separate type. The secretions in this type of asthma are frequently surprisingly difficult to remove even with the bronchoscopic aspirator. The mucosa frequently has a dry appearance and the secretions become more liquid as the bronchi become smaller.

Another frequent finding is collapse of the trachea and larger bronchi during cough or expiration. The more frequent type is a bulging forward of the posterior wall leaving a crescentic-shaped lumen. Sometimes the anterio-lateral walls are also involved and form a triangular shaped lumen. Occasionally this collapse is so great that lumen can be seen only on inspiration. Collapse sometimes is observed in children and even adults and must be considered a normal finding in those individuals.

Bronchospasm has not been observed at all frequently although Horn and Freudenthal have reported seeing it and the author has observed it in one child. Kiefer has observed rythmical contractions of the bronchi. Lukens has described urticarial patches occurring in the main bronchi in two cases.

Physiology of Bronchial Asthma. In a consideration of the pathological physiology of bronchial asthma three factors must be taken into consideration, namely: bronchospasm, swelling or thickening of the mucosa, and increased secretion. The relative amount of semi-rigid support of the tracheobronchial tree, i. e., cartilage, becomes less as the bronchi become smaller and accordingly the relative amount of smooth muscle tissue becomes greater. Therefore, bronchospasm would be functionally greatest in the smaller bronchi. Huber and Koessler, and Kountz and Alexander have reported in their autopsy examination of asthmatic patients that there was a thickening of the walls of the bronchi due to hypertrophy of smooth muscle tissue. This would decrease the lumen of the bronchi not only by

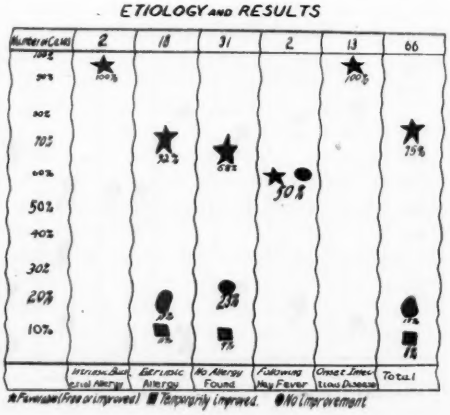

Chart 4.

the increased thickness of the walls but also by the increased power of the bronchial musculature.

Moore, in 1925, observed collapse of the trachea and larger bronchi. This finding is not constant and may occur normally in some patients. The mechanism which causes this collapse is not known, but it is thought to be due to the increased peripheral intrapulmonic pressure. In accordance with this conception, the collapse is not significant in the production of the obstructive dyspnea but is rather a passive response and due to the weakness of the tracheobronchial walls. However, Lukens has suggested that it may be the cause of the extreme dyspnea in some patients.

Bronchitis in bronchial asthma is practically a constant finding. The allergic reaction of the respiratory mucosa is undoubtedly similar throughout the respiratory tract except as modified by its local peculiarities. The bronchitis in the uncomplicated, paroxysmal, interval-free type of bronchial asthma is minimal and is probably entirely allergic. This type of patient usually coughs up clear mucoid secretion as the acute asthmatic attack subsides. This type of bronchitis is rarely seen by the bronchoscopists because it responds well to the usual methods of the asthma treatment. As the bronchial asthma becomes worse or its duration is prolonged, a chronic bronchitis develops along with a pulmonary emphysema.

The swelling of an acute allergic bronchitis and the thickening of a chronic bronchitis along with the increased secretion causes a reduction in the size of the lumen. This reduction is relatively greater in the smaller bronchi than in the larger, and the area of obstruction is therefore beyond the vision of the bronchoscopist. The bronchi are constantly changing in size and shape during respiration, being larger during inspiration and smaller during expiration. Therefore this obstruction would be functionally greater during expiration.

Another factor which must be taken into consideration in the production of bronchial asthma is pulmonary atelectasis. Clarke and Tucker have observed this complication in three cases. Relief was obtained in two cases by bronchoscopic aspiration of considerable quantities of obstructing secretion. Clarke believes that small areas of atelectasis are not uncommon in bronchial asthma and that this atelectasis may explain some of the more severe asthmatic paroxysms.

Probably no one of these mechanisms is predominant in the production of bronchial asthma but rather a combination of these and perhaps others of which we are not cognizant at the present time. The reflex phase received considerable emphasis some time ago but apparently is not considered so important today.

Mechanism of Bronchoscopic Relief. The methods by which bronchoscopy relieves bronchial asthma may be listed as follows: removal of secretion, stretching and dilatation of the bronchi, breaking into the vagus reflex arc, application of drugs and in perhaps other ways.

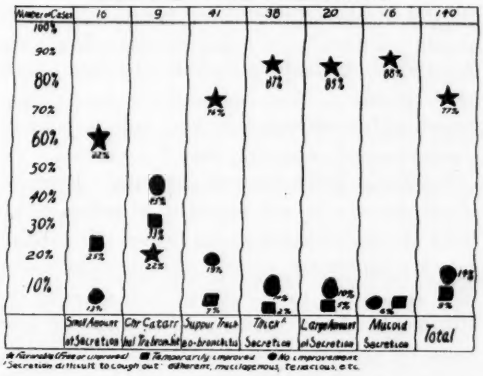

Chart 5.

Aspiration of secretion is probably the most significant mechanism. The secretions which are blocking the airway and are of such a nature that they can not be removed by cough and ciliary action are aspirated. The removal of these secretions aids the defensive and reparative processes of the mucosa causing an improvement in the bronchitis with subsequent lessening of the secretions. In those cases complicated by pulmonary atelectasis aspiration of the obstructing secretions causes an improvement in the atelectasis and the asthma. In those cases of intrinsic bacterial asthma due to a bronchitis, aspiration not only has a favorable effect upon the bronchitis but in addition removes a considerable amount of the offending allergens to which the patient is sensitive and in this way perhaps also improves the asthma.

Some asthmatic patients are temporarily improved by almost anything that is done to them;

the psychological effect being apparently predominant. In this regard bronchoscopy should have a wonderful effect. Upon the other hand, the stretching of the bronchi, extreme stimulation of the mucosa and the local anesthetic may break the vagus reflex arc sufficiently to prevent its reestablishment for varying lengths of time and in that way have a favorable effect on the asthma.

The bronchoscopic applications of cocaine, adrenalin, silver nitrate, bland oils, sodium bicarbonate and other drugs have been used extensively. The earlier writers considered these applications to be of considerable value but the present conception seems to be that they do not materially effect the response to bronchoscopy. Proetz, and Lierle and Moore have demonstrated that 10 to 20% cocaine solution and 0.5% silver nitrate solution have a detrimental effect upon the cilia of the nasal epithelium. Therefore these drugs should be used cautiously in the tracheobronchial tree because they may impede pulmonary drainage by stopping the ciliary action.

Results of Bronchoscopic Therapy. Bronchoscopic therapy is not intended to influence the basic allergic diathesis of the patient. It is therefore a symptomatic method of treatment and is only an adjunct to the allergic management and treatment. An exception to this might be those cases of intrinsic bacterial allergy of bronchitic origin in which bronchoscopy would have a therapeutic effect on the etiological bronchitis.

A survey of the literature has been made and all of the cases of bronchial asthma which have been bronchoscoped and individually reported have been charted and analyzed according to age, age of onset, duration, etiology and bronchial pathology. The response to bronchoscopy has been classified as favorable, temporarily improved, or no improvement. Those cases which were reported as free or improved without relapses or with relapses which responded to further bronchoscopic therapy are classified as a favorable response.

The purpose of this survey is to compare the response to bronchoscopic therapy with the various factors just mentioned. These cases have all been taken from the original reports and only the factors specifically mentioned in each report have been tabulated. All of the cases had had other methods of treatment unsuccessfully.

One hundred and forty-eight cases were charted and 135 of these were suitable for this study. Ninety-eight or 73% obtained a favorable response. Twelve or 8% were improved temporarily and 25 or 19% were not improved. (Table 1.)

Table 2 shows the cultures of the bronchoscopic aspirations and generally confirms similar investigations.

Chart 1 shows the results by age with definitely poorer response beyond the age of 50. The age group 20 years and under does not contain a significant number.

Chart 2 shows a poorer response as the age of onset is later in life.

Chart 3 shows a lessening of the favorable results as the duration of the disease increased and some improvement in the response in those patients with the disease 16 or more years. It is interesting to note in this connection that those patients who had had asthma for more than half of their lives (11 out of 67 patients), had a 100% favorable response.

Chart 4 shows that those patients whose onset of the asthma was associated with an acute infectious disease had a better response than those with other etiological factors.

Chart 5 shows that patients with a chronic catarrhal tracheobronchitis responded less than any other type of patient to bronchoscopic therapy. Those patients with scanty secretion responded poorly while those with definite secretion, no matter what the type, responded distinctly better.

TABLE 1. RESULTS OF BRONCHOSCOPIC THERAPY

Total Number of Cases—148

Diagnostic only	8	Favorable	98	73%
Bronchoscopic therapy not indicated	5	(Free or improved) Improved temporarily	12	8%
Revised Total	135	No improvement	25	19%

TABLE 2. PATHOGENIC ORGANISMS IN BRONCHOSCOPIC ASPIRATIONS

Number of Cases Reported—35

Strep. viridans	20	57%	Staph. Aureus	9	26%
Hemolyticus	6	17%	Albus	3	9%
Communis	2	6%	Hemolytic	4	11%
Micrococ. Catarrhalis	8	23%	Pneumococcus	7	20%
Cinereus	2	6%	B. Influenzae	1	3%
One organism			13	37%	
Two organisms			16	46%	
Three organisms			6	17%	

TABLE 3. RESULTS OF BRONCHOSCOPIC THERAPY DURING ACUTE ATTACKS

Total number bronchoscoped	13	
Relieved	12	92%
Temporarily worse then unchanged	1	8%

In summarizing: the factors which indicate a more favorable response to bronchoscopic therapy are younger patients, shorter duration, earlier age of onset, onset associated with acute infectious disease and with secretion which is purulent, mucoid, large in amount or difficult to cough up.

Table 3 shows relief to have been obtained by bronchoscopy during acute asthmatic attacks in 12 out of 13 cases. The unimproved patient was worse for 12 hours and then improved to the condition prior to bronchoscopy.

These results of bronchoscopic therapy indicate that there are certain conditions occurring in bronchial asthma which indicate the degree of response to bronchoscopic therapy. The following diagnostic classification of bronchial asthma has been arranged in order to show these conditions.

DIAGNOSIS OF BRONCHIAL ASTHMA

Etiology
- Allergy
  - Extrinsic
  - Intrinsic
    - Tracheobronchial
    - Infection elsewhere
  - Undemonstrable allergy
- Onset associated with infectious disease

Pathology
- Tracheobronchitis
  - Minimal or allergic
  - Chronic catarrhal
  - Suppurative
- Secretion difficult of removal
- Pulmonary emphysema

The determination of the type of secretion present in the tracheobronchial tree prior to bronchoscopy is difficult because the secretion in the patients who respond well is of such a nature that it is inadequately removed spontaneously by coughing. The type of secretion which these patients expectorate is frequently much different from the secretion as it is observed bronchoscopically. On several occasions patients have been observed to expectorate a whitish clear mucoid sputum and on bronchoscopy a few minutes later dirty grayish mucoid globules adherent to the tracheal mucosa were observed. Quite a few of the patients who respond well to bronchoscopy notice a sensation of tightness, or constriction or obstruction in the chest before an attack starts. Usually if these patients are bronchoscoped before the attack starts it does not occur and the sensations are relieved by the aspiration. Many of these patients will return for bronchoscopy on their own accord because they know an attack is imminent and can be prevented by bronchoscopy.

Technique of Bronchoscopy in Asthma. Bronchoscopy should be considered the final phase in the examination of the asthmatic patient and therefore it should be preceded by a complete examination including history, physical, allergic, x-ray, urinary, blood, sputum and oto-laryngological examinations.

The technique of bronchoscopy is essentially the same for asthmatic patients as for other types. The principles of bronchoscopy as laid down by Chevalier Jackson should be applied to this type of work. The examination and stimulation by the anesthetic of the pharynx and larynx will in some patients precipitate an acute asthmatic attack, therefore it is best to precede the anesthetization by an appropriate dose, usually 0.5 cc. in adults, of 1-1000 epinephrine solution administered subcutaneously. The anesthetic being used for these patients now is 2% pontocaine. The possibility of the patient being sensitive to the anesthetic always must be taken into consideration.

SUMMARY

The value of bronchoscopy in bronchial asthma is diagnostic, obtaining secretions for vaccines and therapeutic.

The bronchoscopic findings, pathological physiology and mechanism of relief by bronchoscopy are discussed.

Of 235 cases reported in the literature 78% obtained a favorable result, 3% were temporarily improved and 17% were not improved; 135 of these cases were individually reported and the results were analyzed according to age, age of onset, duration, etiology and tracheobronchial pathology.

The conditions which indicate a more favorable response are an onset associated with an infectious disease and secretion difficult of spontaneous removal.

The conditions which indicate a poorer response are a small amount of secretion and a chronic catarrhal tracheobronchitis. The results are also poorer as the age of the patients and duration of the asthma increase.

A diagnostic classification of bronchial asthma is presented which includes these conditions which effect the response to bronchoscopic therapy.

The place of bronchoscopy in the treatment of bronchial asthma and the technique of bronchoscopy in asthma are discussed.

BIBLIOGRAPHY

Clark, J. A., Jr.: Pulmonary atelectasis as a complication of bronchial asthma. Arch. Int. Med. **45**: 624-630, 1930.

Clerf, L. H.: Bronchoscopy as an aid in the diagnosis and treatment of bronchial asthma. J. A. M. A. **89**: 872-875, 1927.

Clerf, L. H.: The present status of bronchoscopy in bronchial asthma. Ann. Int. Med. **9**: 1050-1056, 1936.

Clothier, J. V.: Bronchoscopic drainage in the treatment of asthma. Eye, Ear, Nose and Throat Monthly, **10**: 9-10, 1931.

Cordier, V., Mounier-Kuhn, P., and Chovin, J.: La bronchoscopie au cour de la crise d'asthme. Lyon med. **156**: 590-592, 1935.

Daily, L. and Daily, R. K.: The value of bronchoscopy in the diagnosis and treatment of asthma. Laryngoscope **39**: 305-309, 1929.

De River, J. P.: The bronchoscopic treatment of bronchial asthma and chronic bronchitis with case reports. Med. J. & Rec. **123**: 180-182, 1926.

Ephraim, A.: Grundlargen und Ergebnisse de örtlichen Behandlung Chronischentzundlicher Bronchialerkrankungen, Verhandlunger d. III Internationalen Laryngo-Rhinologen Kongresses, Berlin, 117-120, 1911.

Evans, E. H.: Bronchoscopy in asthma and other cases, Indian Med. Gaz. **68**: 627-628, 1933.

Feinberg, S. M.: Broncho-pulmonary infections and asthma, Ill. M. J. **56**: 442-446, 1929.

Freudenthal, W.: The endobronchial treatment of asthma, New York M. J. **93**: 1219-1222, 1911.

Galebsky, A.: Ueber die Auwendung der Bronchoscopic en zwei Fallen van asthma. bronchiale. Monatschr. f. Ohrenh. **42**: 359-360, 1908.

Gottlieb, M. J.: The endobronchial treatment of bronchial asthma and asthmatic bronchitis. New York M. J. **114**: 333-336, 1921.

Halliday, A. A.: Bronchoscopic method of diagnosis and treatment of certain disorders of the lungs and bronchi. Canadian M. A. J., **17**: 561-563, 1927.

Horn, H.: The bronchioscopic treatment of bronchial asthma. J. A. M. A. **55**: 930-934, 1910.

Huber, H. L. and Koessler, K. K.: The pathology of bronchial asthma. Arch. Int. Med. **30**: 689-760, 1922.

Jackson, C.: Chronic nonspecific infections of the lungs, their bronchoscopic and esophageal phases. J. A. M. A. **87**: 729-736, 1926.

Jackson, C. and Jackson, C. L.: Bronchoscopy, esophagoscopy and gastroscopy. 3rd Ed. W. B. Saunders Co., Philadelphia, 1934.

Jackson, C. and Jackson, C. L.: Diseases of the air and food passages of foreign-body origin. W. B. Saunders Co., Philadelphia, 1936.

Keiper, G. F.: The bronchoscopic treatment of spasmodic bronchial asthma, Ann. Otol. Rhinol. & Laryngol., **23**: 53-58, 1914.

Kounty, W. B. and Alexander, H. L.: Death from bronchial asthma, report of three cases. Arch. Path., **5**: 1003-1019, 1928.

Lierle, D. M. and Moore, P. M.: Effects of drugs on ciliary activity of mucosa of upper respiratory tract. Arch. Otolaryng. **19**: 55-65, 1934.

Lukens, R. M.: Bronchoscopy in the treatment of asthma—observations on twenty-one cases. Laryngoscope, **35**: 227-234, 1925.

Moore, W. F.: Ciliary inhibition or destruction in Tracheobronchial asthma with notes on bronchoscopic treatment. Am. J. M. Sc. **169**: 799-806, 1925.

Nowontony, F.: Bronchoscopic und bronchoskopische Behandlung von Bronchial asthma. Monatschr. f. Ohrenh., **41**: 697-711, 1907.

Prickman, L. E. and Vinson, P. P.: Bronchoscopy in asthma, J. Allergy **4**: 286-293, 1933.

Proetz, A. W.: The effect of certain drugs upon living nasal ciliated epithelium. Ann. Otol. Rhinol. & Laryngol., **43**: 450-463, 1934.

Ramirez, M. A. : Endoscopy in bronchial asthma, S. Clin. North America, **9**: 741-742, 1929.

Ramirez, M. A. and St. George, A. V: The bronchoscopic treatment of bronchial asthma. Med. J. & Rec., **125**: 327-329, 1927.

Syme, W. S.: Bronchoscopy in the treatment of asthma. Brit. M. J., **1**: 868-869, 1917.

Tucker, G.: Bronchoscopy in disease-bronchial asthma. M. Clin. North America, **10**: 123-124, 1926.

Van Loon, E. L.: Bronchoscopic observations in asthmatic children. Ann. Otol. Rhinol. & Laryng., **45**: 881-885, 1936.

Weille, F. L.: Studies in asthma. XIV Bronchoscopy in asthma. New England M. J., **205**: 848-854, 1931.

Winters, M. H.: Some features of bronchoscopy and esophagoscopy. Ill. M. J., **53**: 416-419, 1928.

DISCUSSION

Dr. Leon Unger, Chicago: Dr. Andrews has handled this difficult subject in a very masterly fashion. He has shown us first, that bronchoscopy in bronchial asthma is valuable because it helps us in our differential diagnosis. Any method of examination that will help us separate the true allergic type of asthma from those other conditions which simulate it is welcome. Too often many allergy specialists, "allergists" if you will, forget that old saying of Chevalier Jackson that "all that wheezes is not asthma." Unfortunately, some men rely too much on the allergic work-up, including skin tests; some lack a good foundation in internal medicine and some lack experience in examining chests which are non-allergic. Bronchoscopy gives us a chance to lessen the percentage of our mistakes.

To me, bronchoscopy for diagnosis is indicated in those patients in whom there is no definite allergic background. I, therefore, believe in bronchoscopic examinations in asthmatics who have not had other allergic conditions, e.g., hay fever; who have no special family history for allergy; and who do not have a high percentage of eosinophiles in the sputum and in the blood; and, also, I like to bronchoscope our failures from allergic treatment. The bronchoscopy may show us, as Dr. Andrews pointed out, a hidden bronchial carcinoma or a foreign body.

Dr. Andrews did well to state that he does not wish to bronchoscope patients who have asthmatic symptoms because of a cardiac or cardiovascular renal disease. In such cases the procedure would be highly dangerous. It behooves all of us, then, who refer cases for bronchoscopy to be sure to examine our patients thoroughly. Such an examination should include a careful history, a thorough physical examination and examinations of the urine, sputum and blood, including a Wassermann test. In all suspected cardiac or renal cases an electrocardiogram and blood chemistry estimations should also be made.

Dr. Andrews states that the vaccines obtained from material aspirated during bronchoscopy are superior to those made from sputum. I would not be too dogmatic about this. It is granted, of course, that theoretically the bronchoscopic sputum should make a better vaccine or filtrate. Practically, however, I am not at all convinced that the vaccines obtained at bronchos-

copy give better *clinical* results than those made from sputum. Indeed, I am not at all convinced that an autogenous vaccine is any better than a good stock respiratory vaccine bought from a reliable pharmaceutical house. Are the good results which can often be obtained from autogenous vaccines specific? I doubt it. I believe with Rackemann that vaccine therapy is non-specific. If you give the patient a good-sized local reaction you are apt to obtain good clinical results whether you use an autogenous or a stock vaccine. I have used both methods.

I thoroughly believe with Dr. Andrews in the value of bronchoscopy in the treatment of some asthmatics. Any procedure is a good one that can pull out some of the sticky secretion which blocks the air passages. Of course, the aspiration must often be repeated. The patient usually feels better, at least for the time being. Too often he relapses; bronchoscopy should be tried several times, at least, in these obstinate cases.

The use of bronchoscopy is, therefore, invaluable from a diagnostic standpoint; it is of definite, though temporary, value in treatment; its value in obtaining better vaccines is questionable.

Dr. H. R. Watkins, Bloomington: This is an excellent paper and certainly is well presented. I like to think of bronchoscopy as an adjunct to the laryngologist, the pediatrician and the internist. Their patients come to us after they have exhausted their side of it and want our help. By the bronchoscope we can collect specimens for autogenous vaccine. If we can remove fixed secretions we are aiding ciliary action. Certainly it has a function of importance in bronchial asthma. The eosinophiles are found in the blood, in the sputum and in the bronchial wall. This has been proved at autopsy, and is not true of any other condition.

Dr. Harry Pollock, Chicago: I appreciated very much hearing Dr. Andrews' paper. It is worked out very thoroughly and shows he went into the subject very deeply. I have had many patients referred to bronchoscopy, and I should say 78% showed improvement, probably due to the better methods that have been used. Some years ago I presented a paper on suspension laryngoscopy, and we had many cases referred to us. We obtained excellent results due to the application of local anesthesia. We used cocaine and adrenalin applying it to the bifurcation. Some cases were free for from three to nine months. There is no question as to its value in diagnosis and for obtaining secretions, but I do not think we ever saw any cures from bronchoscopy, except in acute cases which probably would have cleared up by themselves. We often find that following bronchial asthma, and following the subsidence of the acute infection, the asthma clears up, but I think the results are due to the local anesthetic used. We had very excellent results at that time. I am also of the opinion that vaccines are not specific. If you use a stock vaccine you get as good results as with autogenous vaccine. Many years ago Dr. Beck and I made all our vaccines, and I do not think the results were any better than with stock vaccines. I do think bronchoscopy is most useful in diagnosis.

Dr. A. H. Andrews, Sr., Chicago: The average ear, nose and throat man considers his duty done when he eliminates the nose and throat as a cause of asthma. That is as far as I have gone, but I am glad that Dr. Andrews, Junior, has gone further. He seems to have wanted to extend his field in some direction which his dad had not gone, and so selected the field of bronchoscopy. We have found many cases of asthma with the cause in the throat or the nose, and I have always felt I had done my duty when I did what I could for that. But adding bronchoscopy to the nose and throat work has gone further, and developed many things I never considered in my field.

Dr. A. H. Andrews, Jr., Chicago (closing): I wish to thank the speakers for their discussion. Concerning the matter of vaccine, I did not mean to compare autogenous with stock vaccines. In the autogenous vaccine the thing to do is get the organisms and we thought we were getting them more accurately by bronchoscopic aspiration. We could go into that further but it does not warrant the time. The earlier workers along this line, principally Ephraim, who published 133 cases in 1911, put a good deal of emphasis on the use of various drugs, but the later workers seem to get similar results by bronchoscopic aspiration alone. We have used pantocaine to get away from cocaine in the bronchial tree. As Dr. Pollock pointed out the percentage of favorable results in this survey is surprising. Of course, it is frequently only a temporary method of treatment, but I am sure many of you could give case reports of patients who have not had a return of their asthma for years following bronchoscopic therapy. We are interested in being able to say which patient will be helped by bronchoscopy, and particularly so, if the results of previous treatment have been unsuccessful.

CLINICAL PROBLEMS IN DIABETES

ROBERT W. KEETON, M. D.

CHICAGO

Education of the Patient. The business world is rehabilitating its equipment. Old machines are being discarded or reconditioned. Efficiency is the watch word and the air is charged with the spirit of accomplishment. Hence it is not surprising to find a patient announcing in one breath that he has diabetes and demanding in another that this disorder be cured. At this point the educational battle begins. The physician assures the patient that the sugar can be removed from his urine if a certain plan is followed. The response is immediate. Do you mean that I am to live on a diet the rest of my life? His attention is called to the fact that he is already eating

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day by day the same foods with slight modifications. So after all a diet may not be such a great trial. From here the conversation moves along smoothly until the word "insulin" is used. Immediately comes the lightning response. "That is the substance that once you start you are never able to stop." After further conversation the patient demands in an authoritative manner, "Now doctor please be specific and tell me what am I to do, I really must be going along." There is just one answer to this question. "You must be educated in the nature of your disease and you must learn to live with it." All physicians know that this is the answer. However, some of the men are busy with other activities, they realize the difficulty of the task and are unable to see how this end can be accomplished. Others have seen or known diabetics, who have blundered along a number of years paying little attention to management and yet remained in apparent good health. Still others may have been inoculated with the impression which is abroad in some circles that one takes the new insulin (protamine) once a day and eats whenever hunger or appetite prompts him. These and other excuses are apt to present themselves to a doctor and justify him in his attitude that a diabetic may be treated rather liberally (loosely) and trust that "nature" will take care of any discrepancies that arise in his management. The difficulty with this view lies in the fact that nature has already deserted the patient. A defect has occurred within the machine, which is wrecking it. In most other diseases, the machinery is intact, but some extraneous agent (infection) has attacked it from without. This attitude is all the more regrettable since the management of diabetes has reached an exact science and there is little or no reason why a patient should die of it. Even under the best treatment a patient with diabetes may die from an atack of acute appendicitis, or he may die of a malignant pneumonia or a cerebral thrombosis, but he should in all of these situations be spared from death because his diabetes was inadequately or unskillfully managed. This type of death is preventable. Just as the responsibility for the cure of diphtheria increased with the advent of antitoxin so the responsibility for exact management of diabetes and the education of diabetics has been increased by the recent advances in our knowledge.

The Diet. Now that we have agents available which will allow the individual to eat normally, there seems to be no further reason for singling him out and setting him up as a target for curious questions by making for him a fantastic diet in which the so-called "diabetic foods" are included. Food furnishes the body with energy and other ingredients necessary for its function. The food given should be adjusted to the patient's requirements. In short, the diet should be an optimal one. If the patient is overweight the calories should be reduced to bring his weight to a normal value. If he is underweight increased calories should be given. If he is a young growing individual sufficient protein must be available for the building of the body tissues. This raises the question as to what a doctor means when he asks the dietitian to serve a "diabetic diet." One might with equal propriety ask the coal merchant to send in a supply of winter coal. Before this can be done intelligently the type of furnace in the house, the number of rooms, the number of windows, the insulation and other facts have to be known. In both instances the problem is a quantitative one. The dietitian might send up a diet which had proven an excellent one for patient "A", but one which might be inadequate for patient "B". Suppose we analyze the method by which individual optimal diets are constructed.

In writing out a diet order a physician is writing a prescription for food. Dosage is a well understood obligation in a prescription for drugs, and it should be equally binding in a prescription for food. In selecting dosages of food the physician must make three decisions, the principles involved are not difficult to master. The physician must first decide the number of calories or the quantity of energy which he wishes to furnish the patient. Upon this factor depends the preservation of weight. He must next prescribe the amount of protein and finally the quantity of glucose. If the quantity of glucose is not known there can be no exact basis for ordering insulin or judging of the patient's progress. When these factors are known the dietitian can then fill the order and translate it into a diet. It would seem that any physician who proposes to treat diabetes or who is forced to treat such patients should acquire sufficient information to meet this requirement.

The conversion of this order into an acceptable diet requires knowledge of foods and falls in the

field of dietetics. In terms of the analogy of the prescription, the food prescription is filled by the dietitian just as the drug prescription is filled by the pharmacist. It is customary for the dietitian to educate the patient in these details. Intelligent cooperative patients soon become adept in judging quantities of food and making substitutions. It is this body of knowledge which terrifies the doctor, who is unaccustomed to this field. As a rule it is not advisable for the physician to undertake this educational work, because he will rarely give the necessary time to instruct his patients thoroughly. However, in almost every community where there is a hospital arrangements can be made for a small consideration with the dietitian or with some other diabetic, who has been previously educated, to do this work. However, I would like to urge upon all physicians an easy method of acquiring this knowledge. Work out for yourself an optimal diet order, have a dietitian translate this into a diet, purchase yourself food scales, and then with the assistance of your wife proceed to weigh all foods eaten and live rigorously on the diet. You will soon visualize 100 gms. of meat, 15 gms. of butter, 200 gms. of 10% fruit without difficulty. All of this knowledge can be acquired without attending a post-graduate course in diabetes.

Insulin. The body depends on insulin for the oxidation of glucose. We now have insulin available from three sources. There is the physiological insulin furnished by the patient's pancreas which is stimulated by absorbed glucose. In the normal individual this supply is adjusted to his requirements and is governed by the rate of absorption from the intestine. Within 30 minutes of the ingestion of glucose there is a maximal secretion of insulin and this quantity is sufficient to check the rise of blood sugar. At the end of 1½ to 2 hours the quantity of insulin is sufficient to reduce the blood sugar to a level of hypo-glycemia and from this time onward the secretion of insulin subsides with the absorption. During the night there is an amount of glucose oxidized sufficient to support the fasting metabolism. When the patient has diabetes correspondence between supply and demand of insulin fails. The secretion of insulin is slow, the quantity below the requirements, and the response to the fasting night requirements is often absent.

The regular or standard insulin, which has been available since 1922, is rapidly absorbed and withdraws at once the glucose from the blood stream into the tissue. Some of this insulin is apparently lost in the urine. The maximal effect of this insulin on the blood sugar is usually seen between the third and fourth hours, at which times reactions occur. The effect on oxidation usually disappears after 6 hours.

The protamine zinc insulin is absorbed uniformly over a period of 24 hours. Theoretically, an equal amount is absorbed in a units time. Practically, the absorption is favored by the activity of the muscles which lie beneath the site of injection and other factors which have not yet been defined. The effectiveness of insulin from any of these sources is gradually augmented by activity providing it is kept below the point of exhaustion or fatigue. The problem therefore of keeping the urine sugar free and the blood sugar within normal limits would appear to be a complicated one. One wishes to match a fluctuating supply of glucose against a supply of insulin derived from three possible sources. It is obvious that the larger the quantity of physiological insulin which is available (in other words the milder the diabetes) the easier the task. Relatively mild diabetics can be kept sugar free easily by supplementing the varying physiological supply of insulin with a small dose of protamine. The protamine furnishes a supply of insulin for the night which is absent in the diabetic and augments his day insulin.

When the defect is more severe it is advisable to have the patient eat a larger number of meals and to eat less at a time. Three meals, a bedtime lunch, and a cup of tea at 4 P. M. are usually provided. In this manner there will be a more or less constant supply of food furnished during the waking hours. This intake is now balanced against a dose of both regular and protamine insulin and against as far as possible a constant degree of activity. The regular insulin lasts usually 6 hours and sometimes 8 hours. The day time activity supplements its effectiveness. The protamine insulin acting through the 24 hours, will keep the urine sugar free during the evening and night hours, when only small quantities of food are available, and bring the level of glucose dissolved in the body water (as represented by the blood sugar) to a normal value in the morning. In the day time considerable dependence has to be placed on the fluctuating supply of physiological

insulin. If this can be conserved and protected the management becomes much easier. The duration of action of these three types of insulin is pictured in Chart 1.

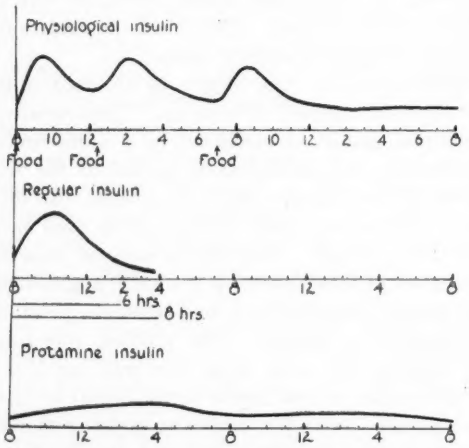

Chart 1. Variability and Duration of Action Different Types of Insulin.

In Chart 2 the behavior of the blood sugar throughout the twenty - four hours (fourteen estimations) is recorded in a patient with arteriosclerosis. On a glucose intake of 175 gms. the average urinary excretion was 4.5 grams. The individual urinary specimens showed small quantities of sugar. The blood sugar levels however remained high between 175 and 275 mgms.

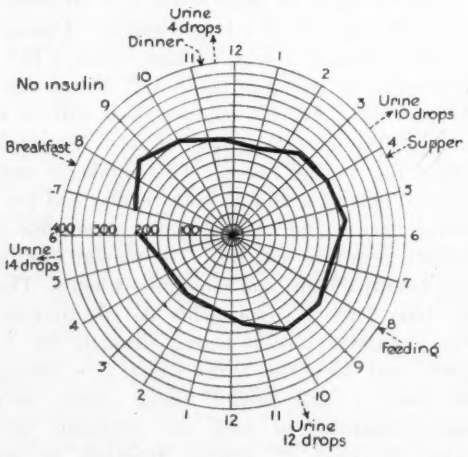

Chart 2. Arteriosclerotic Patient (A). Diet: Glucose 175 gms., Calories 1800.

In Chart 3 the blood sugar curve is shown when the patient had the same caloric intake with a reduction of his glucose to 152 gms., a decrease of 23 gms. This was accomplished by a simultaneous increase in fat. On the new diet the urine showed an excretion of 2.7 gms. of glucose in 24 hours, a removal of only 1.8 gms. from his urine. The blood sugar levels remained uniformly high although the average was somewhat below that seen in Chart 2. This illustrates the behavior of an individual with a high renal threshold who desugarizes by diet adjustment, only when the restriction has been severe. If given the opportunity of eating freely he can burn large quantities of sugar.

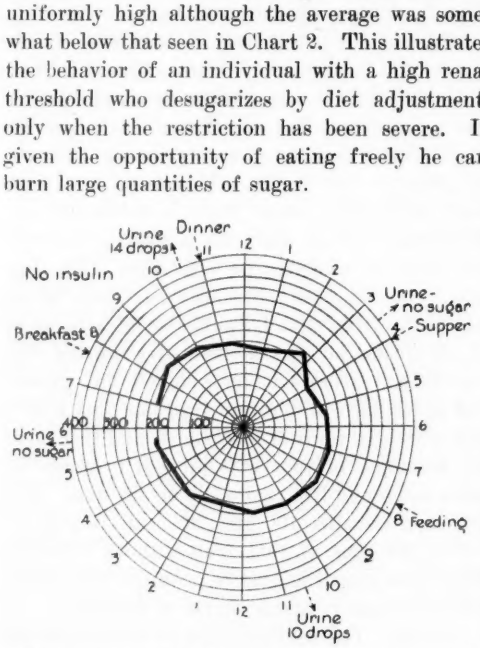

Chart 3. Arteriosclerotic Patient (A). Diet: Glucose 152 gms., Calories 1800.

In Chart 4 the effect of protamine zinc insulin on the blood sugar is shown when the patient has

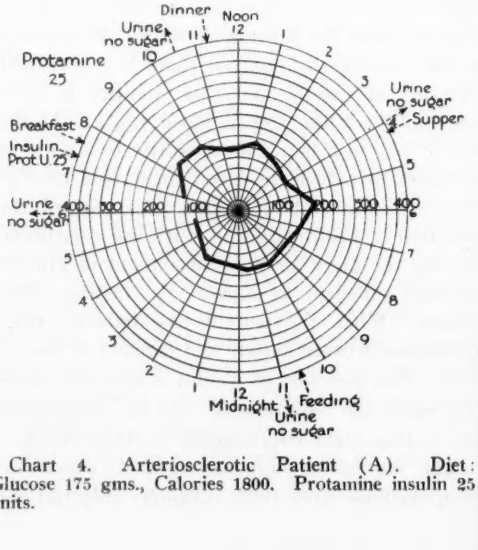

Chart 4. Arteriosclerotic Patient (A). Diet: Glucose 175 gms., Calories 1800. Protamine insulin 25 units.

been returned to the original diet containing 175 gms. of glucose. Twenty-five units of insulin have been given before breakfast.

Charts 5, 6 and 7 depicts the behavior of the blood sugar of a severe diabetic child, 12 years of age on a glucose intake of 200 gms. who was given first regular insulin and later regular and protamine insulin.

In Chart 5 two doses of regular insulin (25-0-20-0) were given. It can be seen that the control of the blood sugar is good between 11 A. M. and 1 A. M. After 1 A. M. the effect of the regular insulin has been lost and the patient's supply of physiological insulin is so low as to allow an elevation of blood sugar and an accumulation of sugar in the body fluids.

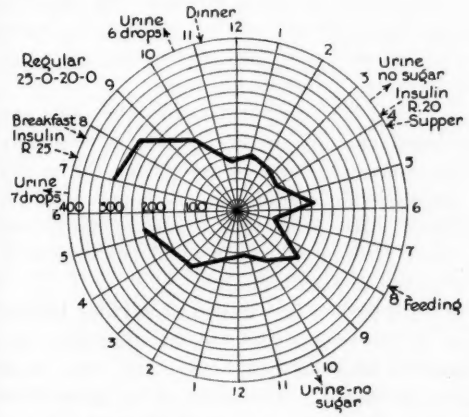

Chart 5. Young Diabetic (B). Diet constant. Insulin regular, 2 doses.

If this patient is to be controlled by the use of regular insulin the afternoon dose should be made smaller and a bedtime one introduced. If the evening dose is maintained at 20 units then a dose at 10 P. M. would cause a reaction around 1 to 2 A. M. When the evening dose (Chart 6) is reduced to 10 units and a dose of 5 units given at 11 P. M., the control is still inadequate but it is obvious that it can be accomplished by the slight increase of the afternoon and night doses.

These curves should be contrasted with the one (Chart 7) obtained by the use of protamine 25 and regular 10 given before breakfast. While the control of the blood sugar is not entirely satisfactory its improvement over the other adjustments, when regular insulin alone was used, is obvious.

The record of a third case (female, age 57), is instructive, but space does not allow the publication of her blood sugar curves. She entered the hospital in acidosis and was rescued from this with the use of regular insulin. To keep her urine sugar free on a certain diet required four injections of insulin (35-15-20-15). She was then transferred to protamine and regular insulin. Her improvement was so striking that at the end of 5 weeks her blood sugar was under control with only 15 units of protamine insulin before breakfast.

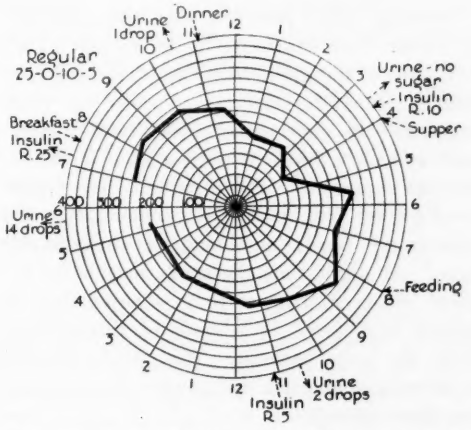

Chart 6. Young Diabetic (B). Diet constant. Insulin regular, 3 doses.

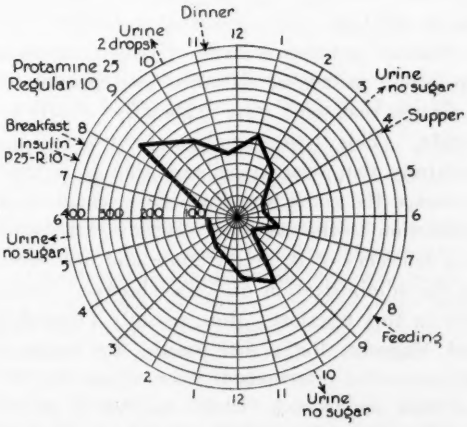

Chart 7. Young Diabetic (B). Diet constant. Insulin Protamine and Regular.

Difficult Clinical Situations. The doctor who sees an appreciable number of diabetics comes to recognize clinical pictures which reproduce themselves with striking faithfulness. A brief discus-

sion of the more troublesome ones will be undertaken.

Pellagra-Like Syndrome. There is first the apprehensive individual who reacts excessively to any emotional stimulus. He may find that he frequently has epigastric pain and consequently has to avoid coarse vegetables and raw fruits. There are at times fleeting attacks of diarrhea. In short the picture is that of an irritable bowel. This bowel reaction is found in well over 50% of diabetic patients whose disease is of any duration.

There are other patients, who have presented the picture described above for some time. They then observe the appearances of attacks of diarrhea of short duration which clear up spontaneously. As time passes these attacks become more and more frequent until a state of chronic diarrhea supervenes. They gradually lose weight, develop a dry skin and a sallow complexion. The number of bowel movements is unbelievably large. At night time the stools may be so frequent and occur with so little warning that the patient is reduced to a state of incontinence. They are truly pathetic. Bismuth is of little or no value, paregoric and powdered opium soon lose their efficacy.

The syndrome of irritable bowel is usually controlled by the methods adopted in non-diabetic patients. One may logically attribute the symptom to the high grade emotional instability seen in diabetic patients. However, when one sees the second picture of uncontrollable diarrhea it is obvious that some other explanation should be sought. This latter syndrome reproduces so faithfully that seen in pellagra that it is hard to escape the conviction that the mechanism of production is the same. Pellagra is attributed to a deficiency of B_2 (G) vitamin and it is cured by the administration of foods (brewers' yeast) rich in this fraction. More recently (Ramsdell and Magness: Ruffin and Smith) the value of intramuscular injections of liver extract No. 343 has been emphasized. Ruffin and Smith believe that the oral powdered liver extract is more effective. In our experience the intramuscular liver extract will slow up the diarrhea sufficiently to allow the oral administration of other sources of B_2. A few cases have been given the crystalline B_1 product intramuscularly. They have shown no significant improvement. This also lends support to the view that we are dealing with a pellagra-like deficiency.

It is very helpful in these cases to remove as much of the fat as possible from the diet, replacing it with large quantities of protein, and to make the diet otherwise bland. When these measures are adopted the diarrhea can be controlled. Diarrhea is a disastrous process to the metabolism. One often does not appreciate the loss in calories, salts and protein occurring in this way. Once it is stopped the whole appearance of the individual changes.

Peripheral Neuritis. It is difficult to appreciate the multiform varieties of neuritic manifestations seen. Following a long period of neglect in management a young boy was brought to to the hospital in severe acidosis. On recovery he complained bitterly of the leg pains, the burning and paresthesias. At times he had lightning-like pains in the intercostal nerves.

A second boy of approximately the same age developed two attacks of acidosis at relatively short intervals. After recovery from the second a gradual wide spread painless motor paralysis occurred. His heart rate at rest regularly was between 140 and 160. He could not turn himself in bed or feed himself.

A third patient (age 62) had lived on a limited diet of his own choice but his daughter continued to keep his urine sugar free with small doses of insulin. He developed a generalized edema with puffiness of hands and extreme muscular tenderness. The extremities were so tender and painful that an alcoholic neuritis was suspected. There are others who have no complaints but an absence of the patellar reflex is noted in the examination.

There are a final group with muscular pains fleeting in character throughout the body. They are usually older individuals in whom arteriosclerotic changes have appeared. Hence one has great difficulty in differentiating these symptoms from those due to the arteriosclerosis.

In general it may be stated that the intensive treatment of these patients with B_1 preparations, of which there are a number available, will give relief from the acute symptoms and if continued over a long period will cause improvement in the more chronic cases.

The Arteriosclerotic Extremity. The patient with the painful arteriosclerotic extremity is one that most of us would like to refer to some one

else. Only a brief discussion of the more important principles of management will be attempted.

When a blood vessel is unable to carry an adequate oxygen supply to a muscle which is actively contracting a pain producing chemical compound is formed. This compound disappears as soon as oxygen becomes available. This is a biochemical statement of the mechanism of intermitent claudication. When a blood vessel becomes too small to supply sufficient blood to a given area collateral vessels begin to develop. It is obvious therefore that the treatment for a painful leg is to put the patient to bed until the collaterals develop. The practical difficulties in applying this principle arise out of the failure of the patient to realize the seriousness of the condition and his unwillingness to pay the price for recovery. Most physicians are willing to force a patient with angina pectoris to bed for two to three months, but they have not as yet realized that this same advice should be given to a patient with intermittent claudication.

The recovery of the circulation is facilitated by the application of a constant supply of controlled heat. A wooden box placed at the foot of the bed over which the bed clothes can be thrown and in which there is a thermostatic control serves the purpose. Such boxes have been described by Star and Sevringhaus. They may be set for any desired temperature and obviate the danger of burning the extremity. They are further valuable in furnishing a warm atmosphere through 24 hours of the day.

When gangrene develops the problems of management increase. If the area of gangrene is large, the absorption great, and an infection established, a decision to amputate at once is a life saving measure. Nothing is accomplished by the postponement of an inevitable amputation. The patient becomes a less favorable risk through delay.

If it is advisable to delay amputation and to follow a conservative plan of treatment, the first decision of importance should be as to the surrounding temperature. It has been customary to heat up such extremities to the body temperature or higher. In so doing one often loses sight of the fact that the tissues of the leg are devitalized, robbed of blood, and are undergoing autolytic digestion. This proceeds more rapidly at a higher than a lower temperature. Allen has recently called attention to an experiment in which the leg of a dog had the blood excluded and was cooled below the body temperature. Recovery was complete in this extremity when the blood was later readmitted. The autolysis is accompanied by swelling which exerts more pressure on the arteries. Into such areas the surface bacteria invade and hasten the destructive processes. This leads to a moist gangrene.

On the other hand heat relaxes vascular spasm and is of more value in embolic than thrombotic occlusions. As a rule these extremities are most comfortable at temperatures of 85 to 90°. Moist dressings may occasionally prove valuable in establishing drainage. However, they are often harmful because of their tendency to macerate the tissue. Finally, the risk to the patient's life of so-called conservative operations on gangrenous extremities is so large that they should not be undertaken lightly.

DISCUSSION

Dr. George W. Parker, Peoria: The management of diabetes has always revolved around a dietetic regime. The patient still prefers a diet prescribing what he may and may not eat without reference to a definite amount. This is equivalent to Dr. Keeton's remark about the physician who wanders into the hospital and writes an order for a diabetic diet without giving any consideration about how much coal it takes to run the individual furnace without smouldering.

Before the advent of insulin the diet in severe cases was indeed a hardship. With the discovery of insulin it became possible to give a liberal diet, sufficient for the patient's satiety and enough to carry on his economic life.

Food habits are so firmly fixed and the will power of the average individual is so weak, that it becomes quite a problem to re-educate the patient. The fewer the restrictions instituted in the management of a case the more likely is the patient to follow the diet. One should not disrupt lifetime habits any more than necessary. It is possible to make a routine so strict and difficult that life is just not worth while. No routine is successful if a patient is hungry or if the change in his daily habits is too revolutionary.

Let me illustrate by the case of an elderly man of German descent, who was wont to take a Swiss cheese sandwich and a glass of beer at bedtime. I should be the last to forbid him this lifelong habit in the treatment of his diabetes.

Then there is the growing child who comes to his mother crying for a lunch. Subtractions can be made from the main meals, if needed, to take care of lunches.

Protamine insulin has solved some of these problems

by giving us an insulin constantly acting throughout the twenty-four hour period.

Do not deduce from what I have just said that I am not in favor of a careful education and instruction in regard to the weighed diet. Every case of diabetes, even if mild, is best managed by establishing his tolerance, raising or lowering his calories to meet the requirements of growth, work and play. Where the intelligence and education of a diabetic prevent an exact calculation and measurement of foods, the tolerance and needs can be worked out just as carefully and a so-called rough measure diet given to the patient. This procedure practically always meets the situation.

Prejudice against the use of insulin still persists and I believe this is partly due to propaganda by various cults and even by some physicians. Then, too, a layman associates habit with the use of the needle. Careful explanation, education and training will dispel this prejudice.

Dr. Keeton's discussion of the use of vitamin B-1 and B-2 (G) brings before us a valuable advance in the treatment of complications, such as certain diarrheas and cases of neuritic pain, which before were quite troublesome and baffling. It is quite likely that looseness of the bowels which we have attributed to dietetic roughage, achlorhydria or pancreatic deficiency may be explained by a vitamin deficiency. When gangrene develops and is at all extensive, amputation is imperative and should always be made high enough to give a good circulation to the stump. This is, in my experience, usually above the knee joint.

Dr. Robert W. Keeton, Chicago (in closing): In general I would like to agree with Dr. Parker. Successful diabetic management can be accomplished without scales. It is important that the patient eat the same quantity of food every day. This may be accomplished by giving the patient a skeleton outline.

Protein Requirements: To meet these he should eat the same size serving of meat each day and two eggs. If he wishes to replace one egg with a ⅓ of a cake of cream cheese this is permissible. He is to take at least a pint of milk, or milk and cream per day. These quantities are so definite that there is little chance for variation.

Carbohydrate Requirements: He should take a glass of citreous fruits daily. He may eat as desired vegetables growing above the ground. Since their carbohydrate content is small a large increase in these entails only a small error. In the cities and small towns the bread is now sold cut into slices which weigh 25 gms. This is the greatest single source of error, but it can be controlled by the device of prescribing for the patient the number of slices allowed.

Caloric Adjustment: This is obtained by eating sufficient fat to satisfy the hunger. Butter, bacon and salad dressings can be taken as desired and in quantities sufficient to maintain weight. On days of rest all of the milk products allowed may be in the form of milk, on week days half or all of it could be cream.

Once a consistent intake of food is accomplished he may be desugarized by gradually increasing doses of insulin.

TYPHOID CARRIER CONTROL IN ILLINOIS*

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Director of Champaign-Urbana Public Health District
CHAMPAIGN, ILLINOIS

With improvement in water supply, better sewage disposal and more meticulous care of milk, it has become increasingly more difficult for the typhoid bacillus to find a vehicle of transportation to a susceptible host. In addition, we have the improved sanitary measures enhanced by widespread inoculation with typhoid vaccine. That these procedures have borne fruit is exemplified by the significant decline of the typhoid mortality rate from 37.7 per 100,000 in 1902 to 1.09 in 1935. There were 71 deaths from typhoid fever in 1936, compared to 1,882 deaths in 1902. The future of typhoid fever and subsequent decline in mortality rate will be directly proportional to the identification and control of the carrier. Here again our determination of the carrier state will be in direct ratio to the amount of consideration given to the proper release of cases as they occur.

At the present time in Illinois one case of typhoid fever is classed in the same category as an epidemic and receives equal consideration from the point of view of an attempt to determine the source of infection. It is only by expending more time and effort on the individual case that we can hope to cope with potential outbreaks of greater scope. Fundamentally the mode of approach in the determination of source of infection must always assume the existence of a carrier, unless, of course, the case may be definitely related to a pre-existing known case. The material to follow will deal exclusively with the typhoid carrier in Illinois and his control.

The final declaration that the carrier state exists in any one individual is an official action of the Illinois Department of Public Health. As cases are routinely released, those who harbor typhoid bacilli in the feces or urine three months after the date of onset are classed as temporary carriers. If these same persons still harbor the organisms at the end of one year following the date of onset, they automatically become chronic carriers. Practically all carriers identified

*Downstate only.

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through epidemologic investigation are of course of the chronic type.

As soon as the carrier state is determined, the person in question is required to sign the carrier agreement form. Recently a change has been made in this form which should be mentioned. The sentence in question which read: "I agree not to handle food for my family or for other people and to use the utmost care in my personal hygiene," has been modified to read: "I agree not to handle food for persons other than for members of my immediate family who have been immunized against typhoid fever within two years, and to use the utmost care in my personal hygiene." The reason for this change was apparent in that the majority of carriers were housewives and the former requirement placed an unnecessary burden on the family in question. Unquestionably, also, previously there were violations of this phase of the agreement with a hazard which we feel has been partially eliminated. The dates of immunization of the immediate family are checked regularly and when the time interval approaches the two year period, the family is informed that re-immunization will have to be acceded to immediately if the carrier is to be permitted the privileges of modified quarantine.

All carriers are visited biannually by the District Health Superintendents, and a report made to this Department. This is primarily for supervision of occupation and residence of the carrier. No carrier may change his residence without notifying the local board of health and the State Department of Health. When a carrier resides on premises from which milk or other milk products are distributed, the carrier is not permitted to handle said milk, milk products or utensils, or to assist in any way in milk production. The aforementioned milk, milk products and utensils cannot be brought into the residence of the carrier, and all milk and cream from such premises must be sent to a pasteurization plant.

For release from the carrier state, specimens of feces and urine must be negative at intervals of one month for four consecutive months. Such specimens must be taken at a hospital and when forwarded to our laboratories, must be accompanied by a certificate of authenticity signed by the superintendent of the hospital concerned. The fecal specimens must be selected from the second and third bowel movement following catharsis. Temporary carriers are encouraged to submit release specimens. The first specimen for release in such cases, however, may not be submitted sooner than one month after the carrier state was determined. When a year has elapsed since the onset, and the person still harbors the organism, no effort is expended by this Department in encouraging the submission of such specimens inasmuch as our experience has been "Once a chronic carrier, always a chronic carrier." Chronic carriers may, however, submit specimens of their own initiative.

Our success in the identification of carriers, of course, relates to the uniformity and completeness with which fecal and urine specimens are obtained from those who were in contact with existing cases within a period compatible with the time of incubation, or those who may have been associated with some possible common vehicle of transmission. Needless to say, the freshness of the specimen assumes paramount importance. No specimens are given consideration in which the time interval between collection and delivery to the laboratory has exceeded two days. In addition, of course, there are minor interfering factors such as the personal inconvenience of mailing specimens, the application of postage, etc.

In our effort to cope with the above difficulties, and to ensure the obtaining of needed specimens in a fresh state, the Illinois Department of Health is now employing a mobile diagnostic laboratory. This laboratory is sent to the area of outbreak and remains there until the epidemiologic survey is completed. The mobile laboratory does not carry on the bacteriologic analysis to final completion, but makes the initial differentiation and then returns the isolated strains to the main laboratory for final identification. With a laboratory of this nature actually in the community in which there are existing cases, the maximum degree of cooperation can be obtained from the local populace. A detailed report of our experience and success with the employment of the mobile laboratory will be forthcoming at a later date.

In the detailed consideration of the available data on the existent carriers, some variation in total numbers will be noted in the various tables.

This is due to incomplete information in regard to the data referred to in the specified table.

Our records reveal that the first carrier identified downstate was in 1919. From that time to date we have on file 160 such cases. Six of these are in institutions and 29 are still classed as temporary carriers; 15 of whom have been identified up to May 1, 1937. Of the total carriers, 16 are Para B, one Para A, and the remainder typhoid. There are three persons who continue secreting typhoid bacilli in the urine, two of whom are in institutions. Of the total 58% are females and 42% males. This is a slightly higher male rate than 32.6% noted by Sentfner and Coughlin,[1] and much higher than that of 20% observed by Bolduan and Frant[4] in New York City. In Chicago the male rate is 28%. Seemingly the incidence of male carriers is higher in the rural communities than in the large cities. Of the total carriers, 14 gave no past history of typhoid fever, but too much significance cannot be attached to this fact; as we are well aware that in the past many cases were missed due to lack of availability of the modern methods of laboratory diagnosis in such cases.

In Table 1 the distribution of carriers is given by occupation for downstate for those in whose records the information was available. Housewives make up 49%, students 11%, those handling food or dairy products 11% and the farmer, 10%. The rest are widely distributed. The high per cent of students deserves some ampliation. The majority of these were identified at the University of Illinois in the routine examination of student food handlers. These are classed as students rather than foodhandlers because, strictly speaking, this occupation was only a temporary means of earning subsistence while in school.

In Table 2 we have the grouping according to sex and age when the carrier condition was discovered.

Table 3 shows the time elapsed in years between the attack of typhoid fever and discovery of the carrier condition. Those in which the interval elapsed was less than one year were identified primarily through routine release specimens. Those in which the interval exceeded one year were of course determined through epidemiologic investigation.

Table 4 shows the number of carriers identified by year from 1919 to 1936. The number of cases of typhoid fever by year is given for the same period in order that a gross comparison may be made between cases and carriers discovered. It is significant that in 1935 and 1936 a marked rise occurred in the number of carriers identified. This suggests immediately more careful release, more detailed epidemiologic study, and finally, more satisfactory laboratory technique for identification of the typhoid bacillus. At this time it would be propitious to state certain pertinent facts concerning the laboratory modifications in regard to cultural identification of the typhoid bacillus. In 1934 the use of bismuth sulphate brilliant green agar (Wilson and Blair medium) was begun as an adjunct to Endo medium. In 1935 desoxycholate citrate agar was employed in addition to the Wilson and Blair, and Endo media. Beginning March, 1936, selinite enrichment medium followed by plating on desoxycholate citrate agar was used in addition to the aforementioned procedures. After December 1, 1936, direct desoxycholate citrate agar plating was replaced by preliminary selinite enrichment followed by plating on desoxycholate citrate agar. This method plus the use of Wilson and Blair medium is the only one in vogue at present. The use of Endo medium has been discontinued. Of 10,199 specimens examined[2] from 1934 to May 1, 1936, 179 were positive on both Wilson and Blair, and Endo media; 262 were positive on Wilson and Blair only; 27 were positive on Endo only. The present consensus is that preliminary enrichment in Selinite F followed by plating on desoxycholate citrate agar will give results slightly superior to Wilson and Blair medium. As routine release becomes more perfected there should be eventually no unidentified carriers except in those missed cases whose incidence is declining because of better diagnostic facilities. As we perfect our mode of epidemiologic approach, we will rapidly determine the existence of those remnant carriers not identified in the past. This is well exemplified by the results of 1935 and 1936.

In further emphasis, using the figures in Table 4, we find the carrier to case ratio for 1933 to 1936 to be: 1 to 132 in 1933; 1 to 126 in 1934; 1 to 22 in 1935; 1 to 10 in 1936. Up

to May 1, 1937, the carrier to case ratio was 1 to 5. This is quite compatible with the decreasing carrier to case ratio observed by Stebbins and Reed[3] in New York State which changed from 1 to 22 in 1929 to 1 to 8 in 1935. From 1919 to 1936 there were 24,197 cases of typhoid fever reported. Considering the 145 carriers identified, we would have 0.59% of the cases acquiring the carrier state. This is considerably lower than the usual accepted figure of 2%. If we consider, however, the period 1931 to 1936, we find that 3.6% of cases were determined to be carriers. This is obviously commensurate with the acquisition and adoption of more efficacious methods.

A recent report[5] of the New York State Department of Health makes mention of the fact that during 1936 the chronic typhoid carrier condition was detected in a larger population of recovered cases than in any previous year. This is in accord with our observations and logically should be associated with improved methods.

Table 6 shows the distribution of carriers by county. Those in Cook county are exclusive of Chicago which has on record 59 carriers. The carriers are widely disseminated involving 60 out of the total of 102 counties.

Summary. A discussion has been presented of the control measures and pertinent data relevant to the typhoid carrier in downstate Illinois. Consideration was given to factors favoring earlier and more complete identification of the carrier state.

BIBLIOGRAPHY

1. Senftner, H. F., and Coughlin, F. E.: Am. J. Hyg., 17: 711, 1933.
2. Shaughnessy, H. J.: Proc. Soc. Ill. Bacteriologists, J. of Bact., 32: 128, 1936.
3. Stebbins, E. L., and Reed, Elizabeth, A. J. P. H., 27: 233, 1937.
4. Bolduan, C. F., and Frant, Samuel: The Medical Officer, 57: 66, 1937.
5. New York State Dept. of Health, Health News, 14: 69, 1937.

TABLE 1. TYPHOID CARRIERS BY OCCUPATION

Occupation	Number	Occupation	Number
Housewife	60	Nurse	1
Student	14	Maid	3
Farmer	13	Foodhandler	2
Dairy Hand	8	Veterinarian	1
Laborer	3	Broker	1
Clerk	4	Banker	1
Truck Driver	2	Other	6
Cook	2		
		Total	121

TABLE 2. GROUPING ACCORDING TO SEX AND AGE WHEN DISCOVERED

Age	Male	Female	Total
Under 10	2	3	5
10-19	12	4	16
20-29	7	12	19
30-39	7	11	18
40-49	10	9	19
50-59	3	12	15
60-69	5	8	13
70-79	0	4	4
Over 80	0	1	1
Total	46	64	110

TABLE 3. TIME ELAPSED IN YEARS BETWEEN ATTACK OF TYPHOID AND DETERMINATION OF CARRIER STATE

Years	Cases	Years	Cases
Under 1	53	20-29	10
1- 4	30	30-39	2
5- 9	6	40-49	1
10-14	5	50-59	1
15-19	1		
		Total	109

TABLE 4. CARRIER TO CASE RATIO

	1919 to 1930	1931	1932	1933	1934	1935	1936	To May, 1937
Carriers Discovered	45	30	39	6	9	34	54	15
Cases Reported	19005	840	1082	792	1137	775	566	74
Carrier to Case Ratio	1–422	1–28	1–27	1–132	1–126	1–22	1–10	1–5
Car. Per Cent. of Cases	0.2	3.0	3.0	0.7	0.8	4.5	9.5	20.0

TABLE 5. CARRIERS DISCOVERED AND RELEASED 1931 TO MAY 1, 1937

Carriers on record at end of December, 1930		45
Carriers discovered in 1931	30	
Released and died in 1931	9	
		21
Carriers discovered in 1932	39	
Released and died in 1932	25	
		14
Carriers discovered in 1933	6	
Released and died in 1933	6	
Carriers discovered in 1934	9	
Released and died in 1934	7	
		2
Carriers discovered in 1935	34	
Released and died in 1935	9	
		25
Carriers discovered in 1936	54	
Released and died in 1936	8	
		46
Carriers discovered to May 1 in 1937	15	
Released to May 1 in 1937	8	
		7
Number of Carriers on Record to Date		160

TABLE 6. DISTRIBUTION OF EXISTING TYPHOID CARRIERS BY COUNTY, ILLINOIS, 1937*

Adams	1	Livingston	1
Brown	1	Logan	1
Bond	1	Macon	8
Champaign	4	Macoupin	1
Christian	4	Madison	8
Coles	4	Marion	1
Cook	5	McLean	1
Cumberland	1	Monroe	2
DeKalb	1	Montgomery	2
DeWitt	1	Morgan	6
Douglas	1	Moultrie	4
DuPage	3	Ogle	3
Edgar	3	Peoria	4
Edwards	1	Piatt	3
Effingham	2	Pulaski	4
Franklin	4	Randolph	1
Gallatin	2	Rock Island	4
Hamilton	3	St. Clair	5
Hancock	5	Saline	2
Hardin	2	Sangamon	8
Henderson	1	Scott	2
Henry	3	Shelby	1
Iroquois	1	Tazwell	1
Jackson	3	Union	1
Jasper	3	Vermilion	2
Jersey	1	Wayne	1
Kane	4	White	2
Kankakee	2	Williamson	4
Knox	1	Will	5
Lake	1		
Lawrence	2	Total	160

*Exclusive of Chicago.

DISCUSSION

Dr. Roland R. Cross, Dahlgren, Ill.: I want to congratulate Dr. Gowen on his excellent paper on the control of the typhoid carrier in Illinois as it emanates from the central office of the department of health at Springfield. Now, I wish to discuss this from the standpoint of a district health superintendent and as it presents itself to a certain extent from the rural districts of Southern Illinois, where we have so much typhoid fever.

It might be well here to give a modern definition of typhoid carrier. A carrier is a person in apparent good health who is infected with some pathogenic organism to which he is himself, for the time being, at least, immune but which, when accidentally transferred to another, may produce an attack of the specific disease.

In the last month, I have investigated the typhoid carriers in five counties, which numbered 15 cases.

Naturally of prime importance is the location of the carrier because the carrier exists, whether he is located or not, and whenever typhoid occurs no effort should be spared to locate the carrier.

Paramount, in my mind, for the control of the carrier, after one has been found is to sell him the idea that he is a carrier and, if he does not control himself, he will be a menace to the health of others as some typhoid carrier was to him. More particular attention should be given to the carrier according to his occupation, meaning that all carriers are not of equal importance as sources of infection.

For instance, let me present some cases I have investigated. Case 1. I have a carrier in my district and living in my township a boy who is eight years of age. It is more than a year since he was declared a carrier. He has attended school and there has been no case of typhoid fever in his community in that time, showing he is under control. Now, how have I controlled that carrier in order that he might attend school? First, I had the Directors of the school finance and promote the immunization of every school child of that district, the school teacher immunized, and, practically speaking, the entire population of that school district immunized. Second, I persuaded the school directors to construct a sanitary toilet and the excreta to be chemically treated each day. Third, the directors installed a water fountain with individual drinking cups to be used, this being a country district where drinking water had to be supplied from wells. Naturally I built a barrier around him.

Case 2. This carrier was a housewife living down in Hardin County, in the foothills of the Ozarks. When I first approached them about her being a typhoid carrier, they were very hostile toward the proposition and the signing of the agreement. This was due to ignorance and I spent about two hours with this family, explaining to them how typhoid fever was contracted and how she could prevent exposing someone else as she had been exposed. In other words, using salesmanship to convince this woman that the department of health was acting as a friend to humanity in trying to control her. She had what was called a "milk house" a short distance from her home and this was where their milk was kept and cooled by running water. She was then getting ready to take some of the milk to a community church supper. I talked with them and reasoned with them and really convinced them that we were right and left them enlightened and glad to cooperate with us in trying to prevent the spread of typhoid fever and so I think the education of the carrier is a paramount issue with the control of the carrier.

Each carrier presents an individual problem. I think it would be wise, indeed, if the department of public health would issue a circular to all known typhoid carriers giving them, in non-technical terms, a general idea of their potential danger to the health of others and of the rules they should observe to prevent their being a menace, stressing the fact that it is only through carriers that typhoid fever spreads.

Dr. C. H. Benning, Peoria: What do they do with the carrier after they find them? Is there any medical treatment undertaken to remove the condition and how and when do they declare them non-carriers? Does the release of the typhoid carrier depend upon the fecal examination or bowel examination?

Dr. Winston H. Tucker, Springfield: If there is a medical treatment for a typhoid carrier, I wish you would tell us; we don't know. Gastroenterostomy has been favored in some cases but there is a surgical risk, and we don't advocate that. However, as to the second question, doctor, we release typhoid carriers on four consecutive authentic stool specimens. I say, authentic. Now, a chronic typhoid carrier will discharge typhoid bacilli at intervals. They will discharge them for a while and then stop and they will continue and then

they will stop. We require cathartics and take the material from the second or third bowel movement. We get some material from the small intestine; a loose movement; not a stool which remains in the colon for three days, which dries hard and all the typhoid bacilli die in that. We are very careful about our specimens. We don't put down a tube for bile drainage. We haven't done it. I know it is done, of course, by health departments in this country. But there are times when the feces will become negative and the bile specimen is still positive. We know that but we haven't carried out that procedure in this State but we have that in mind and we will get at it in the future, I assure you. However, in general, we believe that, once a carrier, always a carrier. We don't encourage releasing, as I tried to point out in the paper. However, we try to be lenient with him and give him plenty of room ventilation, and, if we can be sure that his feces and urine are free of typhoid bacilli in four consecutive monthly specimens, he is then released from the typhoid carrier agreement.

Dr. Benning: If you have one isolated case of typhoid fever in a community, how much effort do you expend in that case to find carriers?

Dr. Tucker: That is a good question. There is a stool specimen from every member of the family and careful questioning to see if there have been visits to that family from relatives or neighbors or friends or any citizens. It is simply a matter of common sense epidemiology; any information at all we can get as to a possible lead as to the source.

Dr. Arlington Ailes, LaSalle: Do you require a cathartic in all of these cases?

Dr. Tucker: Yes.

SURGICAL PATHOLOGY OF TUMORS OF THE BREAST

R. B. MALCOLM, M. D.

CHICAGO

This paper is based upon the study of 250 cases of tumors of the female breast, diagnosed histologically and treated at the Research and Educational Hospital of the University of Illinois, College of Medicine in Chicago.

MAMMARY GLAND

Embryology: The breast is composed of two embryological elements, (a) Glandular tissue derived from the ectoderm by a process of inbudding; (b) Supporting connective tissue derived from the mesoblastic subcutaneous tissue over the fascia of the pectôralis major.

(a) From the deepest stratum of the ectodermal bud arises a number of solid buds, exactly similar to those of the sweat glands. The stalks of these buds form the epithelial lining of the lactiferous ducts. Each bud forms a lobe which subdivides into several lobules, which at first solid become canaliculized, opening by a patent duct through the nipple.

(b) As the glandular buds grow into the subcutaneous mesodermal tissue they become surrounded by perilobular and periductal sheaths. The deep and superficial portions are connected with the anterior sheath of the pectoral muscle and the skin for they are all part of the same subdermal layer.

Lymphatics. During the third fetal month the skin and subcutaneous tissues become invaded by the developing system of lymphatic vessels. The periductal and perilobular lymphatics communicate through the septal or interstitial vessels with the superficial mammary and retromammary lymphatics. The superficial communicate with the subcutaneous and the deep with those of the pectoral sheath. Both of these join in the circummammary lymphatics, and from these pass efferent vessels to the pectoral and central nodes of the axilla; other efferent vessels pass from the circummammary to the anterior intercostal nodes of the upper four spaces.[1]

Histology. The mammary gland is a compound alveolar gland consisting of from 15 to 20 lobes, each of which is subdivided into lobules. An excretory duct passes to each lobe, where it divides into smaller ducts, which in turn open into alveoli. The alveoli are lined by a single layer of low columnar or cuboidal epithelial cells resting upon a homogeneous basement membrane. Both lobular and lobar ducts are lined by similar epithelium but as the nipple is approached there may be two layers and at the nipple the epithelium becomes of the squamous variety.

Anatomy. The mammary gland rests upon the fascia of the pectoralis major and is held in position by fibrous bands attached to the skin and the pectoral fascia. The major portion of its arterial supply comes from the external mammary artery which is a branch of the lateral thoracic. In addition there are branches from the 2nd, 3rd and 4th perforating branches from the internal mammary and also from the same

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level lateral branches of the intercostals. The venous return corresponds to the arterial supply.

Lymphatics. The lymphatic return corresponds to the venous return. The major lymphatic drainage passes along the vessels adjacent to the external mammary vein and thus is returned to the pectoral nodes in the axilla, then to the infraclavicular group, and by way of the supraclavicular nodes to the thoracic duct on the left side, and the right lymphatic duct on the right side, thus entering the circulation. In addition the deeper lymphatics go by way of the sternal group to the mediastinal nodes. As the lymphatics of the breast communicate with those of the pectoral fascia there may be drainage along all the fascial planes, viz. those of the pectoralis major and minor, the serratus anterior, the external oblique and even along those of the rectus sheath.

The mammary gland is well encapsulated and is enveloped by pads of fat which gives the breast its rotund contour.

TUMORS OF THE MAMMARY GLAND

In this series of 250 cases the largest group is that of carcinomata of which there are 141. The benign cases number 109. There were no malignant tumors of mesoblastic origin.

Benign Tumors. The following varieties composed this group: 92 fibro-adenomata, 11 cyst-adenomata, 3 papillomata and 3 lipomata.

Fibro-adenoma. The age incidence in decades is as follows: 2nd 10, 3rd 45, 4th 18, 5th 18, 6th 1. The largest group occurred from 20 to 30 years when practically 50% of the total appeared during this period. The clinical history in all cases was essentially the same: During the menstrual period there was complaint of pain in the breast which disappeared on cessation of the flow. The pain called attention to the breast and a tender lump was noticed, which in nearly every case was found in the periphery; there was no discharge from the nipple and the fear of malignancy was the usual cause of medical consultation. The mass was usually single, fairly firm, even nodular, freely movable, not adherent to the skin or fascia, in all cases complete excision of the tumor was done.

Histology. About 50% were intracanalicular, the remainder extra. The amount of fibrous tissue varied greatly, some cases were almost pure fibroma while in others there was a marked predominance of adenomatous tissue.

Cystadenoma. 11 cases. Age incidence in decades, 3rd 2, 4th 3, 5th 3, 7th 3. Usual clinical history similar to that of fibro-adenoma. Tumor was in central portion of breast, rounded but occasionally nodular. Complete excision done.

Histology. All cases showed cystic dilatation of ducts with the presence of adenoma in the wall of cyst. In 3 cases there was a papillomatous growth into the cavity of the cyst.

Papilloma. 3 cases. Two occurred during the 4th decade and one during 5th. Each case gave a history of recurring bloody discharge from the nipple, no tumor noted by either patient or attending surgeon. Exploration of the whole breast was done and in each case a simple mastectomy was performed. Grossly each resected breast showed a centrally located tumor mass which showed a papillomatous growth in a dilated duct, the cavity of which was filled with old blood.

Histology. Marked hyperplasia of duct epithelium which is thrown into folds but with no invasion of the basement membrane. No increase of interstitial elements.

Lipoma 3 cases. Two during the 5th decade and one during the 6th. All were encapsulated fatty tumors within the substance of the breast.

Histology. Simple lipoma.

MALIGNANT TUMORS

In this series there are 141 malignant tumors, all of epithelial origin as follows: Adeno-carcinoma 117, scirrhous carcinoma 18, squamous cell carcinoma 4 and 2 papillary cyst-adenocarcinomata.

Quadrants of Breast Involved in Carcinoma

Upper lateral	Lower lateral	Upper medial	Lower medial
70	47	41	35

Involvement of Nipple—7.
Radical Mastectomies—130.
Cases having axillary metastases at operation—72.

Adeno-carcinoma. Age incidence in decades: 3rd 1, 4th 16, 5th 47, 6th 35, 7th 14 and 8th 4. Every phase of this condition was encountered, from one month's apparent duration to a history of a tumor for 4 years. The usual complaint was a painless lump in the breast, the upper lateral quadrant being the one most involved. X-ray examination of the thorax was done in

all cases and only negative ones were operated upon. In this group 108 cases were done with resection of the pectoral muscles and complete excision of the axillary lymph nodes, the latter showing carcinomatous metastases in 58 instances. These metastatic lesions varied in size from that of a small pea to that of a hen's egg. In a few cases it was necessary to dissect away nodes which completely encircled the axillary vein. Several cases showed extensive involvement of the pectoral fascia. The operations were performed by four different surgeons, the most radical procedure being done by the writer who consistedly resected, in addition to both pectoral muscles, the fasciae of the serratus anterior, the external oblique and the anterior sheath of the rectus down to the level of the umbilicus.

As noted above only nine cases in this group were not subjected to the radical operation. Three simple mastectomies were done on account of the extensive involvement, and in these cases axillary nodes were palpable but not resected and naturally are not included in the metastatic group in that no histological examination was made of these nodes. The remaining six cases were treated by x-ray alone.

Histology. The majority proved to be of the medullary type. There were six cases which were undoubtedly of ductal origin, but to avoid confusion these were left in this group. Several arose from sweat glands. We were unable to prove definitely the exact origin of many others although they were of the adenocarcinomatous variety.

Scirrhous Carcinoma. Of this variety there were 18 cases with the following age incidence: 4th decade 3, 5th 9, 6th 4, and 7th 2. This series gave the longest history of the presence of a tumor in the breast which accounts for the exceedingly high percentage of axillary metastases; 14 out of 18 cases showing axillary involvement and 2 of the remaining presenting clinical evidence. 16 radical mastectomies were done, the other 2 cases were treated by simple mastectomy and x-ray, on account of the extent of the lesions.

Histology. Areas of carcinoma cells surrounded by marked proliferation of fibrous tissue.

Squamous Cell Carcinoma. Four such cases were seen and they all arose in the region of the nipple, with extension centrifugally. No clinical diagnosis of Paget's disease was made. These cases did not show any spread to the axillary lymph nodes. Age incidence: 6th decade 3 and 7th 1.

Histology. All cases showed a typical squamous cell carcinoma arising in the region of the nipple, causing erosion in this area and then spreading peripherally along the lactiferous ducts.

Papillary Cystadenocarcinoma. 2 cases. Age incidence: 6th decade 1 and 7th 1. These were centrally placed and undoubtedly arose from an original benign lesion. No metastases noted.

Histology. Proliferating malignant papillary growth filling a cystic area. In one case there was only a small area of invasion into the surrounding tissues beyond the cystic wall.

Dissemination of Carcinoma of the Breast. Sampson Handley laid down the principles of spread of carcinoma many years ago and with slight change these principles are still accepted, viz. 1. Direct extension, 2. Lymphatic permeation, 3. Lymphatic emboli, 4. Venous emboli.

Direct extension: Under this heading can be included all adjacent invasion other than that through the lymph vessels. This was seen in this series as extensive local growth due to invasion of the surrounding areas. Extension of the tumor by this method is slow compared to the second type.

Lymphatic permeation: In this manner the spread can be rapidly disseminated to even distant parts in a very short period of time. This type means that the carcinoma cells invade a lymph channel, multiply and then obstruct the lumen causing the vessel to rupture and disseminate the tumor to other areas, a retrograde involvement may be set up and Carnett says "retrograde permeation of the trunk lymphatics is a more rapid process than permeation of the small lymphatics of the fascial plexus."[2] As the superficial and deep lymphatics of the breast communicate with those of the pectoral fascia, extension along these planes may be very rapid and thus cause early involvement of the pectoral nodes. Over 50% of the cases in this series showed metastatic lesions in the axillary nodes, only a few of which did not present an almost continuous procession along the course of the external mammary vein and lateral thoracic vein. This phase has convinced the writer that

most of our cases showed permeation rather than lymphatic emboli.

Permeation of the lymphatics is undoubtedly the method by which there can be extensive spread to the pectoral fascia, the axillary and mediastinal nodes, the diaphragm, the thoracic and abdominal viscera, the lumbar nodes, the spine, the pelvis and even to the brain. Everyone of these types of metastases has been in evidence in the follow-up of this series. Carnett[3] again says "retrograde involvement of the lymphatics along the posterior wall of the abdomen extends into the pelvis long before subcutaneous permeation nodules reach the upper abdomen." In this manner there can be extensive distant involvement and yet very little can be noted near the primary focus.

Ewing,[4] quoting Gross from 423 autopsies, placed the organs in the frequency of involvement in the order: pleura 50.9%; lungs 49.9; liver 48.6; bones 20.5; brain 9.4; ovary 8; opposite breast 7.8; ura mater 5.9; kidneys, retro-peritoneal nodes and uterus 5.7 to 5.2 and other organs less than 5%.

The citation of one particular case is an excellent example of diffuse lymphatic permeation.

A. O., aged 32 years, in January, 1935, noticed a small lump in her right breast. Was seen by the writer in February and operation advised. At that time there was only a small painless mass in the upper lateral quadrant. No clinical evidence of malignancy. Patient was seen again in 3 weeks when the clinical evidence had developed, viz., nodular firm mass, lymphatic edema and dimpling of the skin but no axillary lymph nodes were palpable. Radical resection of the breast, both pectoral muscles and fasciae was done. Even at that short time there was extensive lymphatic permeation which was even palpable at operation. The diagnosis was scirrhous carcinoma and there was secondary involvement of the pectoral and infraclavicular lymph nodes. X-ray treatment was given. 16 months later there was complaint of pain in the right sacral region, x-ray was negative but x-ray treatment was given to this area. In September there was positive x-ray finding of rarefaction in the iliac bone. At intervals of three months, x-rays were taken showing the spread until the whole pelvis is now motheaten and extension up the spine with collapse of the body of the 3rd lumbar vertebra. In April, 1937, a small mass developed in the upper lateral quadrant of the left breast. This was excised as it gave the appearance of a primary tumor. Histologically it was an adenocarcinoma and as far as one can tell is a primary tumor. At no time has there ever been any recurrence locally and no x-ray evidence of metastases to the lungs, nor is the liver enlarged.

Lymphatic emboli. Undoubtedly a certain number of these cases showed this method of spread but once the emboli reach the axillary nodes the picture remains the same as the foregoing type.

Venous emboli. This type is much less common than one would imagine as early metastases to the lungs are not frequently encountered.

Summary. 250 cases of tumors of the female breast have been studied clinically and pathologically. In this series there are 141 carcinomata. (56% of total.)

130 radical mastectomies were performed. 72 of this group showed axillary metastases on histological examination of nodes. (55.3% of cases operated upon radically.)

The 11 remaining cases all showed clinical axillary metastases, thus making 83 cases showing histological and clinical metastases. (58.8% of all carcinomata.)

In only 2 cases is there a certainty that malignancy arose in an original benign lesion.

Bibliography

1. Keith, A.: Embryology and Morphology. E. Arnold, London. 1913.
2. Carnett: Surg. Clin. of North America, 17: 4, 1937.
3. Carnett: Surg. Clin. of North America, 17: 24, 1937.
4. Ewing, James: Neoplastic Diseases, 2nd edit., page 528.

X-RAY THERAPY IN CANCER OF THE BREAST

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The literature presents conflicting statements and statistics concerning the employment of radiation therapy in connection with operation for carcinoma of the breast; and in the mind of the average surgeon there still exists considerable skepticism as to the value of radiation as well as a notable lack of understanding of the principles underlying proper technic and dosage. In every breast cancer case the clinical and gross pathological factors must be evaluated and a plan of irradiation mapped out with respect to the operative procedure, so that one knows pretty well in advance what frequency of application, what intensity and dosage of each individual séance, what total dosage, what filter, focus-skin distance and portals are appropriate; and this course when embarked upon should be followed without interruption and only with such minor

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modification as reactions may indicate. Such a plan requires just as much technical knowledge, training and judgment born of experience as does the surgical procedure. Few surgeons have found it possible to spend time to acquire this training and experience in radiological applications, yet I have more than once had the disturbing experience of having a patient only a half or a third through the planned treatment series inform me that the attending surgeon had said no more treatments would be required, or that the séances might be suspended for a few weeks and then possibly resumed, or that it would be better to space out the treatments at longer intervals; or of having the surgeon call me on the telephone and blandly informing me that he thought the patient had had enough x-ray therapy! X-ray management of breast cancer requires a thoughtfully and scientifically planned course of treatments, accurately executed.

Statistics may render great aid in the evaluation of certain methods, yet they may lead to erroneous conclusions. One must consider the source of the calculations, the material involved, the probable value of the work done. It is therefore necessary to set aside a great mass of figures offered and accept for judgment only those which come from large clinics with an abundance of controlled biopsy material, where the facilities for follow-up are satisfactory, and where the criteria for radiotherapeutic technic are strictly up to modern standards. One well known clinic recently published statistics which seemed to show that the addition of x-ray applications to surgical treatment actually shortened the life expectancy of breast carcinoma patients operated on; yet a little inquiry would have revealed that the radiological technic would be considered by most of us as grossly inadequate and that a manifest unfairness was evident in the statistical computations. For instance, it is unfair and illogical to include in the surgical statistics only those cases considered operable and to embrace in the x-ray column all cases receiving therapy, even those for early or late postoperative recurrences and metastases, or those whose disease was considered too far advanced for any surgery and were sent for radiotherapy rather than have nothing at all done.

The statistics which seem most reliable originate in such institutions as the famous tumor clinics in Stockholm, Lund, Paris, London, Zurich, the Memorial Hospital of New York City and similar large institutions maintaining thoroughly efficient departments for following up end-results. The statistics from such institutions show beyond question that the five-year survivals after combined operation and radiotherapy adequately administered are nearly double the figures obtained after surgery alone. One must consider these statistical observations very seriously, for they can hardly be subject to question. The Swedish figures are particularly valuable inasmuch as the government pays the travelling expenses of patients to and from the tumor centers, for treatment and for follow-up.

Furthermore, the statistics on cases treated eight or ten years ago are hardly comparable with the results which may be reasonably expected from the treatment now being given, because of the improvements of technic and apparatus which have come about within the last decade, and yet the five-year results now available constitute facts which are not easily explained away. They leave the surgeon practically under bond to subject all his cases of mammary carcinoma to radiotherapeutic supplementary management in connection with his surgical attack.

What cases of breast carcinoma should have x-ray treatment?

1. There has been no dissension over the proposition that in those cases unsuited for surgery x-ray therapy is clearly indicated. This group includes not only cases where an otherwise operable tumor is not submitted to surgery because the patient refuses operation or because other co-existing disease renders operation out of the question, but also cases with fixation of the breast tumor itself to the chest wall, supraclavicular glandular involvement, definite involvement of the opposite axillary nodes, diffuse subcutaneous nodules, diffuse inflammatory carcinoma involving a considerable skin area, pleural or mediastinal metastases or more remote metastases. Life expectancy is usually materially prolonged where proper irradiation is given in such cases. In a few instances little benefit is seen, and some patients may be damaged by over-treatment so that life is shortened and suffering increased. On the other hand the

great majority are benefited and live from one to five years longer than would be possible without radiation, with partial or complete relief from suffering over a considerable period. I have seen metastatic bone involvement, even so severe as to render the patient a helpless bedridden wreck, restored to normal and the patient enabled to resume her usual activities for as long as five years. Such palliation is infinitely worth while even though obtainable in a minority of cases. Adair reported 37 patients treated by irradiation alone with 36% alive over five years. Even metastases to the lungs and pleura do not contraindicate palliative efforts by radiotherapy.

2. Cases operated on but showing signs of inoperable recurrence offer no favorable field for radiotherapy and yet all authorities join in agreement that the application of x-rays or radium or both is the only recourse. A small non-adherent skin lesion or a small movable nodule may be looked upon as operable if no other evidence of disease is found, and it is justifiable to remove such a recurrent nodule, giving irradiation before and after the excision. Wide dissemination of the recurrence must be assumed if several such lesions are present, and in such cases attempts at operative relief are surely futile. If very advanced breast recurrences are present, one may only hope for such relief of suffering as may be obtained by adequate doses of pain-relieving drugs and frequent dressings of any foul ulcers to satisfy the patient that treatment is still in progress. Of those cases of recurrence in which, with reason, something favorable might be anticipated from palliative radiotherapeutic efforts, about 25 per cent will be alive and in comfort three or four years later. These patients must be kept under constant observation and general health upbuilding measures. Some of my cases have maintained their normal home and social activities for more than five years after the discovery of the first osseous metastases. Particularly striking improvement has been observed in several cases of disabling metastatic involvement of the lumbosacral spine, where complete recalcification has taken place with restoration of normal function. In a few cases collapsed vertebral bodies have recalcified in their compressed form and have become symptomless.

3. In the primary operable group an increasingly large proportion of surgeons have recognized the value of radiotherapy as an adjunct to surgical attack on breast carcinoma. Many believe that if properly administered x-ray therapy is useful after operation to prevent or discourage recurrence, those very arguments for post-operative prophylactic treatment indicate the value of pre-operative radiotherapy.

Statistics concerning postoperative radiation following breast operation are difficult to analyze, for the results depend upon a number of factors: (a) whether operation was radical or only resection of the breast itself; (b) whether the tumor was non-adherent without palpable lymph nodes; (c) whether the tumor was non-adherent, but palpable lymph nodes were present which on section showed carcinomatous invasion; (d) whether the tumor was adherent and lymph nodes involved; (e) whether there was a large adherent tumor with enlarged supraclavicular nodes and skin ulceration.

In the group of simple tumor without adenopathy, which comprises only five or ten per cent of cases coming to our clinics, results are excellent by surgery alone or combined with radiation. The difficulty of being sure not to overlook small but involved axillary lymph nodes is so great that one cannot depend on palpation, even at operation, to exclude them. In spite of good results in this favorable group from surgery alone, it is our opinion that associated radiotherapy should not be omitted. Anschütz found nearly 30 per cent. of ten year cures in this group by routinely combining postoperative x-radiation with surgery. In the other groups no one denies the indications for postoperative irradiation.

The value of pre-operative radiation therapy.—The case for preoperative irradiation is growing stronger as statistics accumulate. In the Radiumhemet at Stockholm since 1921 preoperative therapy has been employed in many cases, as well as the postoperative treatment; and the tendency to preoperative treatment is steadily increasing. In one section all breast cancers have for several years been receiving preoperative treatment. The aim is to act upon the neoplastic tissue, its surroundings and possible metastases. The hope is to establish a diminution of the perinodular infiltration thus facilitating radical operation; to cause attenuation of

the neoplastic virulence thus reducing the danger of operative dissemination of tumor particles; and to initiate by irradiation a certain resistance in the body against latent metastases in an early stage of development. This latter hope has some good foundation in clinical observations. The plan of treatment is such that the least possible damage will result to surrounding and underlying tissues, and to cause a minimum of systemic upset. Tangential radiation is utilized where possible. The tumor often disappears entirely, and in the majority of cases it diminishes considerably. Our tendency has been to increase the intensity of our dosage, but to extend it over a longer period of time.

Under this mode of adequate intensive prolonged pre-operative therapy, some apparently inoperable cases become operable. In a case where surgery is planned I never consent to give the pre-operative series without having the patient's promise to go on with the surgery as planned by the surgeon who refers me the case; and plans are made for possible further irradiation after recovery. I believe a radical operation should always follow such an irradiation series, no matter how completely the lesion may seem to clear up. A lapse of time is needed after terminating the pre-operative irradiation before proceeding to the surgery. This period has been gradually lengthened year by year. The best time for the operation is forty to sixty days after the termination of the x-ray treatment, to allow time for the return of the skin to normal and to permit full development of the perinodular fibrosis and other biological changes upon which the favorable results depend.

Just before he died Bloodgood was unceasing in his efforts to advocate pre-operative irradiation of breast cancer. He urged that there is no danger whatever in giving pre-operative irradiation to clinically operable breast cancers, and no danger in delaying the complete operation from two to three months devoted to a thorough course of irradiation. The majority of surgeons are willing to give irradiation a trial in hopeless and inoperable cases but there is an increasing number of surgeons who feel that the moment pre-operative intensive irradiation begins, the danger of delay is averted, so there is ample time for a carefully planned course of treatment with x-ray and an appropriate further delay of eight to ten weeks before the surgery is done. There is good ground for believing that if there is no existing internal metastasis there is very little danger of its occurring or of further axillary gland involvement after properly performed pre-operative irradiation.

Bloodgood in 1935 stated: "At present, throughout the entire world, the modernly and efficiently trained operator fears and wishes to avoid any delay the moment the diagnosis of cancer of the breast has been made, clinically or at biopsy. Apparently we have evidence to conclude that this is based upon fear and not on facts; and on the most careful study of my cases up to date, my entire evidence confirms the statement that there is no danger from further delay if the time is taken for proper pre-operative irradiation." . . . "Of course, all the clinically malignant cases are now irradiated first, no matter what the degree of malignancy may be."

All clinically benign or doubtful tumors should be excised and sent to the laboratory. Unless they are distinctly benign, irradiation should be commenced at once while waiting for the decision of the several pathologists to whom sections are submitted. When cancer is diagnosed the irradiation is completed before the radical operation is performed. When the sections show a benign lesion irradiation should be stopped, of course, and no harm has been done.

Bloodgood further stated: "I am convinced that we have sufficient evidence to demonstrate that closure of the wound after the excision of a tumor of the breast and thorough pre-operative irradiation promise the patient more, even when the axillary glands are involved, than the immediate complete operation without irradiation. There is sufficient difference of opinion, however, and both procedures will be followed in various proportions by the different operators of the civilized world. Those who give pre-operative irradation, with and without preliminary biopsy, are at present in the minority, but their number is gradually increasing, and those who are proceeding with immediate operation, because of the evidence of a distinctly malignant tumor, although still in a majority, are diminishing in numbers."

It must be admitted that a third of a century of breast surgery leaves us without great hope that the present percentage of five- and ten-year

cures will be appreciably raised by any modification of the present highly developed surgical technic. On the other hand there has been a steady increase in percentage of five-and ten-year survivals when to the radical surgery is added the steady improvement in radiotherapeutic technic. Dosage measurements are now precise, whereas a decade ago we had no accurate means. Marked advances have been made in our knowledge of the effects of radiation and in the technical application of x-rays and radium. Both have their field of usefulness. The radium is especially valuable in the treatment of local nodules, the x-rays for a well-distributed homogeneous radiation effect.

The use of radiation therapy either before or after operation for breast cancer, by all our modern concepts means a prolonged therapy which is also more costly than the relatively simple and short treatment courses of twenty-five years ago. In the early days we could use any diagnostic x-ray apparatus with a filter of aluminum and we soon had given enough x-ray to tan the skin. Any definite skin reaction approaching vesiculation was feared. Dosage measurements were rather unsatisfactory and empirical methods of dosage estimation made all of us over cautious. Today we realize that a good result requires the delivery into the disease-bearing tissues and into the potential avenues of cancer dissemination of a dose several times that required to kill epithelial cells. To accomplish this requires high voltage of at least 200 peak kilovolts; high filtration with copper or silver or equivalent; longer focus-skin distance; very carefully chosen treatment portals with protection of surrounding parts; and a consequent enormous increase of the intensity of the radiation. The result is a great multiplication of the expense and prolongation of the time which the physician-radiologist must personally devote to each case. The period of treatment, taking our hint from Regaud and Coutard's success in head and neck tumors, is usually spread out over twenty-five to thirty or more seances, given daily or as nearly so as the patient can tolerate. There are great individual differences in susceptibility to radiation, to which the plan of radiotherapy must be adapted. I now routinely employ a combination of the saturation dose method of Pfahler and the fractionated dose method (Coutard) in all my pre- and post-operative breast irradiation.

Pre-operative irradiation, by this plan, really requires a rather definite diagnosis of cancer. Though I have not seen any harm result from pre-operative intensive x-ray therapy given in a case where later surgery showed the lesion to be benign, one feels considerable chagrin over the unnecessary effort and expense. Ewing, Adair, and others at the Memorial Hospital have devised an aspiration biopsy method which they consider satisfactory.

There are some distressing complications, such as pneumonitis with fibrosis and in some cases anemia, but fortunately they are not frequent, and in the majority of cases recovery takes place spontaneously. It is well to watch carefully for them and to take such prophylactic precautionary measures as may be indicated.

Ample statistics from reliable sources now show that at the end of five years with no treatment 12 per cent of breast cancers will be alive: surgery alone promises 35 per cent cures and surgery with irradiation 55 per cent cures. Is it not then proved that every surgeon is duty-bound to associate radiotherapy with his surgical attack on this serious disease?

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ICTERUS IN THE NEWBORN

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Icterus of the newborn is divided by Helmreich[1] into the following groups: Icterus neonatorum, icterus gravis, septic icterus, luetic icterus, and icterus due to congenital atresia of the bile ducts.

Icterus neonatorum occurs so frequently it is usually referred to as "physiologic jaundice of the newborn". Helmreich, in Vienna, found 80% of full term babies, and 100% of prematures jaundiced. It has been variously estimated that from 15% to 100% of newborns are icteric. The disparity of statistics in this regard is probably due more to technique of observation and standards of selection of cases, than to actual variations of the occurrence of icterus in various communities. Bonar[2] suggests that there are

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three distinct degrees of icterus neonatorum, viz., latent, transient and true icterus. In the first group, there is an increase of bile pigment in the serum, but no tinting of the skin. Rood Taylor[3] found that all the newborns he examined had latent icterus, showing icteric indices over three times that of the normal adult. In transient icterus, "the tint is light, and there is no staining of the tissues, the coloring being due to bile in the lymphatics". In true icterus, there is a deposition of bile pigment into the tissues.

Aside from the tinting of the skin, and perhaps some drowsiness, there are rarely any untoward symptoms in icterus neonatorum. The stool contains bile, while the urine is usually free from bile pigment. The pigmentation is first noticeable on the trunk, and about the neck. If a more extensive jaundice develops, the extremities, mucous membranes and conjunctiva are usually involved in turn. The recession follows the reverse order, and is complete in ten days to three weeks. Examination of the blood shows an increase in bilirubin content which may be measured by icteric index, the spectrometer, and the Van den Bergh reaction. The indirect diazo reaction of Van den Bergh is given, indicating the extra hepatic origin of the pigment.

Like so many of the common phenomena of life, a complete understanding of the etiology and pathogenesis of physiologic jaundice has been difficult to attain, and investigators still quibble over the relative importance of various factors. Its universal occurrence, its limitation to the first week of life, its self-limited course, and its uniformly benign character require one to seek an explanation in the anatomic and physiologic peculiarities of the newborn.

Before precise laboratory methods were available, anatomists sought a complete solution of the question in mechanical factors influencing circulation of blood about the liver, and flow of bile into the intestine.[4] Pinching of the bile ducts between the lobes of a swollen liver compressed by the moving diaphragm, was Hasse's explanation. Others sponsored such theories as swelling of Glisson's capsule; obstruction of the large bile ducts by desquamated cells and mucus: a catarrhal inflammation spreading from the duodenum. All of these theories would explain only an obstructive jaundice, which did not fit with the clinical picture of bile filled stools and bile-free urine. Quinke's notion that bile pigment was absorbed by the immature intestinal mucosa, and short-circuited directly into the blood stream through the ductus venosus, was more tenable, but failed to fit in with more recent observations.

Minkowski[5] removed the livers from geese and found the geese developed no jaundice. From this, he deducted that without the liver there can be no jaundice; that is, that all bile pigment is made, as well as excreted, only by liver cells. This influenced the reasoning of Knopfelmacher, and Yllpö, who believed that more bile was formed than the ducts could carry, and was consequently excreted from the liver cells back into the blood.

When Van den Bergh[6] applied the diazo reaction to icteric blood serum, he found that bilirubin from cases of bile duct obstruction gave a color change immediately (a so-called direct reaction), while in hemolytic icterus, a reaction was obtained only after precipitating the serum protein with alcohol, an indirect reaction. This gave a means of discerning the origin of bilirubin. In applying the tests to newborns, Grulee[7], in 1925, and others since, have found that in icterus neonatorum, the indirect reaction is uniformly obtained, indicating that the bilirubin has not been excreted by the liver cell, and resorbed into the blood, but is of hematogenous origin. Cases of indubitably obstructive jaundice, however, did not always give the direct reaction, in this way not conforming to the findings in the adult. Therefore, we may still be unable to entirely rule out some resorption of bile, as suggested by Quinke.

Time does not permit a review of all the work upon which the present day conception of icterus is based, but a few established facts, and a statement of the modern theories may be of value. The fetus living in a state of anoxemia, due to the inefficient aeration of the fetal blood, develops a compensatory increase in red blood cells and hemoglobin, so that there is a distinct polycythemia at birth. With oxygenation after breathing has been established, a rapid reduction in red cells takes place, freeing hemoglobin[8], which is split by the reticuloendothelial cells in the capillary bed to bilirubin, and a colorless iron containing fraction. Thus the bilirubin content of the blood, which is already high in all babies at birth, is further increased.

Lereboullet[9] found more bile pigment in the

blood from the umbilical artery than from the umbilical vein, indicating that before birth bile is excreted through the placenta. The interruption of the placental circulation at delivery cuts off this route of excretion.

It is believed that the function of the liver cell is not to make bile pigment, but to selectively excrete that which has been brought to it from the phagocytic cells of the capillary bed. While the normal adult liver cells would very rapidly pick this bilirubin out of the blood, and excrete it in bile[10], the liver cells of the newborn are not capable of handling this extra load efficiently. This is possibly because of the accumulation of thick bile in the small bile ducts which have been shown histologically to be greatly distended[11], or is possibly due to suppression of excretory function from injury of the cells by anoxemia[10] or toxins. The infant kidney also is resistant to excretion of bile pigment, as evidenced by the bile-free urine in the milder cases.

Czerny, Keller and Unger[12] believe that liver cell injury is secondary to bacterial development in the intestine with the absorption of toxins, or the organisms themselves, through the easily permeable intestinal mucosa. This would explain the occurrence of apparent epidemics of icterus frequently encountered, and their observation that thoroughly cleaned nurseries might be free from epidemics for many months. However, the very early occurrence of the jaundice, and its absence in slightly older infants with really severe intestinal infections, makes it unlikely that intestinal toxemia is a major factor in all cases of icterus neonatorum.

As yet eluding satisfactory explanation is the selective distribution of the pigmentation in various tissues, and the variation in the intensity of the jaundice in different individuals with the same icteric index. There is evidently a capillary threshold determined by factors influencing osmotic tension.

It seems logical, then, to consider icterus neonatorum not as a disease, but as a symptom brought about by a variety of forces and conditions peculiar to this period of transition from parasitic to autonymous existence.

The incidence of icterus neonatorum was noted in 3,000 babies born in twelve months in the normal obstetrical ward of Cook County Hospital, in 1931 and 1932. Of these, approximately 45% were Negro, and 55% were white babies. They were examined once in the first week of life, and the incidence of icterus and other variations from the normal were recorded. 737, or 24.4% were more or less icteric. The percentage of icterus varied with the age at examination, as illustrated in Table 1. It is probable that the actual rate of occurrence of clinical icterus is best shown by the 1,610 babies examined when three, four, five, and six days old, of whom 495, or 30.7% were visibly icteric. The skin pigment of the colored babies evidently interfered with the interpretation, for in only 11% of these was jaundice noted, compared to 35% in the whites. At this rate, the icterus incidence in the white babies observed between the fourth and seventh days is about 41%.

The visibility of icterus also varies with illumination. A case readily noted in bright sunlight may be scarcely discernible on a dark day, and may show no tinting if observed by a yellow artificial light. All of the examinations in this series were made by daylight before a large window, but not in direct sunlight. The monthly variations noted in Table 2 may be partially accounted for by the poor light during the winter months.

The physiologic type of jaundice is usually said to appear on or after the third day of life, and before the tenth. However, of 597 babies examined when one day old, 53, or 8.8% were somewhat icteric. The histories of all of these were carefully checked, and it was found that none developed severe jaundice, nor was their progress affected.

Inasmuch as prematures are said to be more frequently jaundiced, it is of interest to note that in this series only 21.5% of babies weighing under 5.5 pounds were jaundiced when examined, while icterus was present in 25% of the babies of average weight, 5.5 to 8.5 pounds, and in 18% of the oversized babies. These figures for the small babies are undoubtedly too low, because many were examined on the first day, before jaundice appeared, and others were not removed from their incubators for examination before the seventh or eighth day.

Parmelee has described the underdevelopment of the newborn breast as an index of immaturity. A comparison of the occurrence of icterus and the degree of breast congestion shows a higher incidence of jaundice (29%) in those with deficient breast congestion than in those with average de-

velopment (24%), while of those with excessive congestion, only 15% were jaundiced. This suggests that breast congestion is a better index of immaturity than is an arbitrary weight standard.

Icterus Gravis. Babies who become deeply icteric during the first day of life face a more serious condition than physiologic jaundice. Icterus gravis is often a familial disease. Infants so affected develop an intense jaundice which begins a few hours after birth. The amniotic fluid and membranes may be yellow. The patient is extremely toxic, often feverish and may have convulsions and skin hemorrhages. The blood smear examined in the first days will often show a marked erythroblastosis. Death may occur within the first week. Those who survive, particularly those whose blood contained many erythroblasts, may become edematous or develop an extreme anemia, or both. At autopsy, many nests of hyperactive hemapoietic tissue are found outside the bone marrow, notably in the liver, spleen and kidneys.[13]

The condition is regarded by some as an immaturity of the hemapoietic system with young, easily destroyed red blood cells dumped into the circulation, the jaundice, anemia and edema being varying symptoms of the underlying disease.[14] Others believe it due to toxins which cause hemolysis and which may or may not stimulate a marked bone marrow response accounting for the appearance of the nucleated red cells in the peripheral circulation.[15]

An interesting neurologic complication of icterus gravis is kernikterus. Zimmerman, and Yannet[16] have reported cases of icterus gravis which at autopsy showed deep pigmentation of the basal ganglions, and the nuclear masses of the brain, identical with kernikterus described in the adult. One two-year old spastic child with athetoid movements had a history of recovery from icterus gravis, and showed at autopsy degenerative lesions in the areas usually affected by nuclear icterus.

Most observers believe early transfusion is a life saving measure in the treatment of icterus gravis. Blood smears should be made early on all babies becoming icteric on the first day. Intramuscular blood should be given at once, and an intravenous transfusion of about 75cc. of matched blood should be given to those cases showing erythroblastosis.[17] At Cook County Hospital, some babies have made good recoveries with repeated intramuscular blood injections, and without intravenous transfusion. This is illustrated by the following case:

A. K., 21 years old, who had had one healthy baby, and whose Kahn and Wassermann tests were negative, was delivered on October 12, of a 7 pound 1 ounce girl. At birth, the baby seemed normal, and had normal skin color. Within ten hours, she became definitely icteric, and was deeply jaundiced at 24 hours, when 10 cc. of blood was given intramuscularly. On the following day, the hemoglobin was 80%, although the red count was only 3,200,000; there were no erythroblasts. Two days later, the hemoglobin had dropped to 40%, and four nucleated red cells were seen; the white cell count was 7,650, of which 40% were mature neutrophils, 9% stab forms, 5% eosinophils, 3% basophils, 28% lymphocytes, and 11% monocytes. The baby was very pale; the spleen was palpable. Blood was again given intramuscularly, and repeated in two days. On the 19th, the baby's eighth day, the hemoglobin was 46%, and the differential count showed polymorphonuclears 26%, stab forms 19%, eosinophils 4%, lymphocytes 36%, and monocytes 15%, with 31 normoblasts to every 100 white cells. Blood was again administered, a total of 55 cc. having been given in four injections. After the first week, the baby nursed well, improved in color, and on the 14th day was one-half ounce above birth weight. She continued to improve and was discharged in apparently good condition.

Septic and Luetic Jaundice. Septic and luetic jaundice result from a hepatitis produced by the invading organisms and their toxins. Some authors group them as subheadings of icterus gravis. Fuchs, for example, divides icterus gravis into those cases with erythroblastosis, those with sepsis, and those falling into neither of the first two groups. Sepsis, and syphilis must always be ruled out in a differential diagnosis of severe newborn jaundice. Luetic icterus is not uncommonly accompanied by an erythroblastic response. This fact speaks against the erythroblastosis being the pathogenic factor in the idiopathic cases of icterus gravis. Sepsis producing jaundice most commonly results from an infectious thrombosis of the umbilical vessels. The prognosis in septic and luetic icterus is bad, and the treatment is that of the underlying condition.

Obstructive Icterus. Jaundice from congenital obstruction of the bile ducts is characterized by onset in the first days of life with a gradually deepening icterus, bile-free stools, bile pigment in the urine, usually a direct Van den Bergh reaction, slowly increasing toxicity, hemorrhagic diathesis, and death in a few weeks or months. The lack of jaundice at birth supports Lere-

boullet's idea of an antenatal placental excretion of bile, previously mentioned.

Kass and Osgood[18] recently reviewed the literature on obstructive jaundice. Few cases were found that had lived beyond three months, and none over one year. Holmes[19] has stated that in 84% the basic pathology is such as to preclude hope of surgical relief. In a few cases there is a single obstruction in the common duct permitting anastomosis of the gall bladder and intestine, but by the time diagnosis is made, and surgical intervention attempted, so much liver damage has usually occurred that recovery is not possible.

A high carbohydrate diet protects the liver from damage, and prolongs the life of these babies. Kass's case lived twelve months. While hemorrhages usually develop as the jaundice increases, this is not always so. The mechanism of a hemorrhagic diathesis in icterus is not understood.

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REFERENCES

1. Helmreich, E.: Wien klin. Wchnsch., 47: 1266-1268, 1934.
2. Bonar, B. E., and Grulee, C. G.: Practice of Ped. Brennemann. W. F. Prior Co., Inc., Vol. I, Ch. 42.
3. Taylor, R.: Am. J. Dis. Child, 34: 989-993, 1927.
4. von Reuss: Diseases of the Newborn. Wm. Wood & Co., 1929, p. 59.
5. Minkowski and Nawnyn: Quoted from Bonar and Grulee.
6. van den Bergh, A. A. H.: Presse Med., 29: 441, 1921.
7. Grulee, C. G., and Mebane, A.: Am. J. Dis. Child., 30: 219, 1925.
8. Goldbloom, A., and Gottlieb, R.: Am. J. Dis. Child., 38: 57, 1929.
9. Lereboullet, Pierre: Lancet, 216: 197, 1929; Paris Med., 2: 384, 1928.
10. Rich, A. R.: Physiol. Rev., 5: 182, 1925.
11. Knopfelmacher, W., and Kohn C.: Monatsch. f. Kinderh., 22: 1, 1921.
12. Czerny, E., and Keller, A.: Quoted by Von Reuss.
13. Buhrman, W. L., and Sanford, H. N.: Am. J. Dis. Child., 41: 225, 1931.
14. Abt, Arthur F.: J. Pediatrics, 3: 7-30, 1933.
15. Hawksley, J. C., and Lightwood, R.: Quart. J. Med., 3: 155, 1934.
16. Zimmerman, H. M., and Yannet, H.: Am. J. Dis. Child., 45: 740, 1933.
17. Kleinschmidt, H.: Klin Wshnschr., 9: 1951, 1930.
18. Kass, I. H., and Osgood, F. P.: J. Pediatrics, 9: 91-95, 1936.
19. Holmes, J. B.: Amer. Jr. Dis. Child., 11: 405, 1916.

TABLE 1. ICTERUS IN 3,000 NEWBORNS

Age in days	1		2		3 to 6		Over 6		Total	
No. examined	597		701		1610		92		3000	
Icterus	No.	%	No.	%	No.	%	No.	%	No.	%
Slight	34	5.7	91	13.0	176	11.0	11	12.0	312	10.8
Moderate	19	3.0	77	11.0	273	17.0	5	5.0	374	11.9
Deep	0	0.0	4	0.5	46	2.7	1	1.0	51	1.7
Total	53	8.7	172	24.5	495	30.7	17	18.0	737	24.5

TABLE 2. MONTHLY VARIATION OF ICTERUS IN INFANTS

EXAMINED WHEN 2 TO 6 DAYS OLD

	No. Examined	No. Icteric	% Icteric
January	290	68	23.5
February	226	59	26.0
March	162	45	28.0
April	168	55	33.0
May	203	62	30.5
June	246	83	34.0
July	...	..	...
August	244	74	30.0
September	204	69	34.0
October	146	52	36.0
November	251	78	31.0
December	158	23	15.0

EXPERIENCE WITH A "PERIODICITY" METHOD OF ROENTGENTHERAPY IN THE TREATMENT OF BUCCO-PHARYNGEAL CARCINOMA

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It is generally recognized that the time factor is of great importance in the conduct of irradiation therapy for malignant neoplasms. By what means the time factor may be employed to maximum advantage in irradiation therapy has not as yet been definitely determined.

A number of years ago Miescher[1] called attention to the fact that following a given dose of x-radiation to the skin, two or three successive waves of erythema could sometimes be observed. The first wave is faint and appears within 24 hours. The last wave is more pronounced and appears usually by the 60th to 70th day.

Coutard has observed successive periods of exacerbation in inflammatory reactions following daily doses of 200r of x-radiation. In the course of clinical and experimental observations upon the reaction of the skin to irradiation we have observed these "periodic" exacerbations of erythema and of erythema and exfoliation. Whether or not this phenomenon is of importance in the irradiation therapy of superficial and deep neoplasms, cannot at present be definitely stated. Coutard has suggested that it might be of importance. In summarizing the results of 379 cases treated by the daily fractionation method he has observed a definite increase in the percentage of five year

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Patient*	Lesion	Therapy						Results
Male, 51 C.V.	Intrinsic carc. left vocal cord	1-6 day 2650 r	13-15 day 1500 r	42-45 day 900 r			TOTAL 5000 r	Clinically well, 10 mos.
Male, 44 D.S.	Intrinsic carc. ant. part larynx	1-4 day 1500 r	13-14 day 1000 r	25-29 day 2000 r	37-38 day 1000 r		TOTAL 5500 r	Clinically well, 2 yrs.
Male, 75 G.A.	Carc. left tonsil, 2cm. diam.	1-5 day 2350 r	13-18 day 2350 r	26-28 day 1500 r	40-41 day 1000 dr		TOTAL 7200 r	Primary lesion disappeared. Cerv. node met. appeared at end of treatment. (Dead.)
Male, 52	Carc. soft palate, 3cm. diam.	1-6 day 2500 r	13-16 day 2000 r	23-27 day 2000 r			TOTAL 6500 r	Lesion regressed but did not disappear. (Dead.)
Male, 44 L.B.	Carc. inner aspect left cheek 5cm. diam. Could not open mouth	1-5 day 2400 r	12-16 day 2400 r	24-26 day 900 r			TOTAL 5800 r	Only slight temporary improvement. Patient dead
Male, 77 W.E.	Carc. floor of mouth left side 2x1cm.	1-5 day	14-16 day	24-25 day	36-38 day		TOTAL 7100 r	Primary lesion healed for 3 mos. but left cervical metastatis has appeared
Male, 68 F.S.	Carc. post rt. base of tongue 2 cm. in diam. Large metastatic mass, rt. cerv. region	1-6 day 2400 r	21-24 day 2000 r	37-38 day 1000 r	41-43 day 1500 r	51-52 day 1000 r	TOTAL 7900 r	Metastatic mass has regressed. Prim. lesion stationary for 6 mos. (Dead.)
Male, 57. F.P.	Carc. involving entire ant. part of tongue. Ext. bilat. cerv. metastases	1-4 day 1700 r	13-15 day 1500 r	30-34 day 2000 r	40-43 day 1500 r	69-75 day 2200 r	TOTAL 8900 r	Marked regression of metastases. Patient died
Male, 52 P.D.	Carc. left border of the tongue 2 cm. in diam. Treat. by radium with regression. Left upper cerv. metastatic mass 5 cm. in diam. X-ray to metastasis	1-4 day 1500 r	12-13 day 1200 r	26-29 day 1600 r			TOTAL 4300 r	Rapid advance of lesion after temp. reduction in size. Patient died
Male, 62 C.H.	Large ulcerating carc. left base of tongue, epiglottis, left pyriform fossa, left false cords. No palpable metastases. Hoarse.	1-5 day 2500 r	12-14 day 1500 r	24-28 day 2000 r	38-41 day 1750 r	50-51 day 750 r	TOTAL 7750 r	Patient clinically well, with no evidence of active disease. Voice normal 2 yrs. after treatment
Male, 66 A.G.	Ulcerating carc. at base of tongue. 1.5cm. in diam.	1-4 day 1600 r	13-16 day 1600 r	26-29 day 2800 r	40-41 day 1200 r		TOTAL 7200 r	Marked improvement for 3 mos., then recurrence of lesion. Patient died.
Male, 64 H.S.	Large fungating carcinoma of epiglottis	1-5 day 2500 r	12-16 day 2500 r	24-27 day 1500 r	38-40 day 1000 r		TOTAL 7500 r	Partial regression of lesion for a few weeks, then resumption of growth. (Dead.)
Male, 62 C.K.	Large fungating squamous cell carc. in epiglottis and base of tongue and extensive bilat. cerv. metastases	1-5 day 2800 r	13-16 day 2000 r	24-27 day 2000 r	50-51 day 700 r		TOTAL 7500 r	Brief immediate partial regression only. Patient died.
Male, 72 N.D.	Carc. of epipharynx with intra cranial extension	1-6 day 1800 r	16-18 day 900 r	27-32 day 2800 r	44-47 day 1800 r		TOTAL 7300 r	No clinical evidence of disease 16 mos. after treatment.

*Table brought up to date, Nov. 1937.

survivals in those groups, whose total treatment periods were 13 to 17 days, 24 to 29 days and 39 to 50 days; roughly these periods are multiples of 13 day periods. A system of periodicity in the chronology of therapy was thus suggested.

In the Irradiation Clinic of the Division of Roentgenology of the University of Chicago Clinics a small series of patients presenting for the most part very advanced carcinomas of the bucco-pharyngeal cavity were treated according to a periodic chronology. Daily or diurnal treatments were given for 4 to 6 days as an initial series; on the 12th to 14th day following the first treatment a second series over 3 days was given, and again on the 24th and 26th day and a third series and again in some cases on the 38th to 42nd day. In most instances the largest doses were given in the first series, the next largest in the 3rd series. Total doses varied from 5,000 to 8,900r measured in air. Two opposing portals were used with most of the irradiation given on the side of the lesion. All irradiation was given at 200Kv., 3 to 10Ma., 50 to 80cm. F.S.D., 1¼ mm Cu and 2 mm Al filter. Details are given in the accompanying table. Biopsies were obtained in all cases and showed varying types of large cell epitheliomas.

Of the immediate results reported in 14 cases 8 are dead of the disease or present active lesions which cannot be controlled a few months following treatment. Of the 6 which are alive, (May 1937) 2 had small lesions, 2 had a very large lesion which has been controlled for 10 to 18 months, 1 has a lesion which has remained stationary and 1 presents a healed primary growth with developing metastases in the cervical nodes.

From this brief and limited experience with a periodicity method of treatment the following impressions are gained:

1. The systemic reactions were less pronounced than would have been the case if similar doses had been fractionated in daily consecutive treatments. This is in all probability due to the rest periods. These periods were also of distinct psychologic benefit to the patients.

2. A periodic system of therapy is an economy of time entailing a smaller number of treatment days than a similar dose fractionated in daily consecutive treatments.

3. No evidence was obtained to indicate that the periodicity method as practiced might afford a very marked difference in results in the treatment of far advanced and large bucco-pharyngeal carcinomas. The good immediate results obtained, might also have been obtained by the daily consecutive mode of treatment over total periods of 18 to 42 or 60 days.

Experience with the method, however, is so limited that no definite conclusions as to its relative efficiency are now possible. That some tissue responses to irradiation take the form of recurring periodic phenomena is a fact and certainly suggests a course for future investigation.

REFERENCES

1. Miescher, G.: Strahlentherapie, **16**: 333-371, 1923-1924.

DISCUSSION

Roswell T. Pettit (Ottawa, Illinois): I might say I have had two or three cases of this type and, as Dr. Brunschwig said, it is a matter of impression. In my experience, it has been extremely limited, at the outside not more than four or five cases, one of those cases being carcinoma of the larynx, with big metastasis of the neck. The thing completely disappeared. It was very striking, but I think I have observed just as striking instances with the fractionated system of treatment over a prolonged period of time, a small amount each day. As I understood Dr. Brunschwig, those measurements were made in air.

Dr. Brunschwig, Chicago (in closing): I just want to emphasize again, as Dr. McNattin mentioned, that this "periodicity" which we practiced is entirely empirical. How do we know this should be done every two or three weeks? I think we all agree that we would like to improve the results in irradiation therapy of bucco-pharyngeal carcinoma by external irradiation. When you have two cases that look alike grossly, microscopically, and you induce a severe skin and mucous membrane reaction in both, when one of them goes away and stays away for a while, and the other regresses partially and immediately proliferates again, you cannot help but want to cast about for some way of improving the treatment.

This "periodicity" suggested by Miescher's work and put into more concrete form by Coutart might be a procedure which will give us better results in the future.

The hemogram in liver disease may closely resemble that of pernicious anemia. The author calls attention to the importance of considering chronic liver disease, cirrhosis in particular, in the differential diagnosis of mild and moderate grades of Addisonian anemia. Rosenberg, D. H., *Am. J. Digest. Dis. & Nutrition* 3:639, 1936.

Thyroid function may be investigated by means of an iodine tolerance test described by E. M. Watson. The relative rate of disappearance from the blood stream of intravenously injected iodine is significant in this connection. The author has determined typical curves for hypo-, hyper-, and normal thyroid conditions. Watson, E. M., *Endocrinology*, 20:358 1936.

MUCOCELES OF THE APPENDIX

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Definition: Mucocele of the appendix is an accumulation of a mucous or mucoid secretion in either the lumen, the wall or the mesenteric attachment of the vermiform appendix.

Historical: The first reference in the literature was made by Virchow[1] in 1863. Rokitansky[2], in 1869, described 4 cases which he erroneously considered colloid carcinoma of the appendix. Fere[3] was the originator of the term mucocele, in 1877. From that time to the present, many references are found in the literature of case reports, and also experimental and pathological study.

Frequency: A recent case of our own at the Cook County Hospital focused our interest upon this rather infrequent disease.

A careful investigation of the records of the institution has revealed the following statistics: —From January, 1929, to January, 1937, 9180 post-mortems have been performed. In only 4 instances or .043% have mucoceles of the appendix been found. From July, 1928, to January, 1937, 9535 surgically removed appendices have been examined, of which 22 or 0.23% of the total were mucoceles.

These figures give one an idea of the relative infrequency of the disease.

Castle[4] in a total of 13,158 autopsies found 28 cases or about 0.2%.

Corning[5] out of 925 appendices sent for pathological examination, found only 5 mucoceles or 0.68%.

Mayo and Fauster[6] reviewed the surgical cases encountered at the Mayo clinic from 1917 to 1930 and found 76 mucoceles in 31,200 cases in which appendectomy had been performed or 0.24%.

Etiology: Occlusion of a portion of the appendicial lumen with holding back of the glandular secretion is probably the underlying cause. When malignant changes occur, however, the pathological picture changes to one of a diffuse pseudomyxomatous peritonitis. Phemister[7] attempted to produce cystic formation of the appendix by artificial obliteration of the lumen of the appendix. In all but one, gangrenous appendicitis developed. In the single uncomplicated case, the appendicial lumen became restored.

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ANALYSIS OF COOK COUNTY HOSPITAL CASES

Clinical Diagnosis:		
Interval appendicitis	9	
Acute appendicitis	5	
Chronic appendicitis	3	
Uterine fibroids	2	Incidental to gynecological operations
Ovarian cyst	1	
Chronic salpingitis	1	
Gastric ulcer	1	
Luetic aortitis	1	Incidental to post-mortem findings
Acute yellow atrophy of the liver	1	
Diabetic coma	1	
Pulmonary T B	1	
Total	26	

From the 26 cases reported it is noted that 9 were latent cases, producing no apparent clinical symptoms.

SEX:	
Males	17
Females	9
AGE:	
1-10	3
11-20	5
21-30	5
31-40	5
41-50	3
51-60	4
61-70	1
Total	26

LEUCOCYTE COUNT: 7,350 to 22,000. Average 12,454. A careful clinical analysis revealed no diagnostic features of the disease.

Case Report: W. L., Male, aged 32 years, was admitted to the Cook County Hospital October 28, 1936.

Present Complaint: Tenderness in right lower quadrant of 2 weeks' duration.

Onset and Cause: Patient stated that he was well until 1932 when he suffered an attack of pain in the right lower quadrant. This was severe enough to double him over, and remained of a constant character. He was confined to bed for four days during which time he felt nauseated on different occasions, and vomited once or twice. He was able to be up and about after the fourth day. From then until the present illness he had been enjoying good health. Two weeks prior to his admission to the hospital he was again taken ill with the identical reduplication of his symptoms. After four days he was again able to be up and around but due to the persistent dragging pain in the right lower quadrant he deemed it advisable to enter the hospital.

In the history of the case, only the following facts were elicited: Jaundice 10 years ago, diagnosed as acute catarrhal jaundice. As a child he had whooping cough and otitis media of both ears.

Physical Examination revealed a well nourished white male who did not appear acutely ill. Temperature 98.4, Pulse 74, Resp. 18, Blood Pressure 140/85. With the exception of a tenderness on deep pressure over McBurney's point, the complete physical examination was negative.

Laboratory: Blood: Leucocytes 9,800; Polymorph 86%; Lymphocytes 12%; Monocytes 2; Hemoglobin 95%.

Urine: Sp. gr. 1.018; Acid; Albumin negative; sugar negative; blood negative. Microscopic examination revealed no blood cells or casts.

The diagnosis of interval appendicitis was made and operation performed.

At operation the appendix was found partially buried in the serosa of the cecum. At the junction of the middle and distal third was found a stricture of the appendix, distal to which were many bean to grape sized clear mucinous cysts extending into the meso-appendix.

The patient left the hospital on the tenth post-operative day, and was feeling well when last seen 3 months later.

Pathological Report: Appendix 6X 0.5 cm. The serosa is slightly injected and the wall slightly thickened. The mucosa gray-tan and at the junction of the middle and distal third, there is a fibrous stricture obliterating the lumen for a distance of 4 mm., beyond which the lumen is patent. There is a soft cyst 2 cm. in diameter attached to the serosa at this junction, also a piece of soft, gelatinous tissue measuring 1.5 cm.

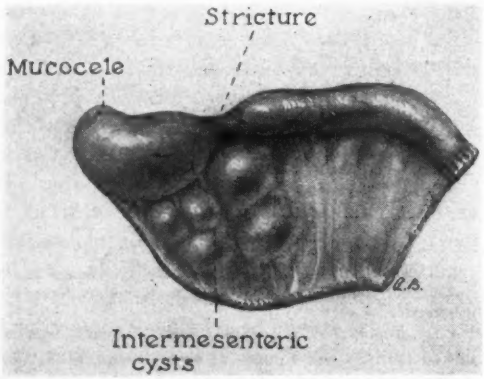

Fig. 1. Drawing of the surgical specimen. Note stricture in the distal third of the appendix associated with the dilated end.
The numerous cysts of the meso-appendix all contained a clear straw colored fluid.

Microscopic: Mucocele of the tip of the appendix and mesoappendix, with marked fibrosis of the submucosa.

CONCLUSIONS

1. Mucoceles of the appendix are very uncommon composing only 0.23% etiological cause of diseases of the organ.

2. There are no clinical symptoms or signs which give any diagnostic aid.

3. 9 or 34.6% of the cases in our series were incidental operative or post mortem findings.

4. The condition should be kept in mind when atypical appendices are removed at operation.

5. The prognosis of these cases is good, with the exception of rare malignant changes which as a rule are primarily ovarian tumors with secondary metastasis to the appendix.

BIBLIOGRAPHY

1. Virchow, Rudolf: Die Krankhafter Geschwülste, 1: 250, 1863.
2. Rokitansky, Carl: Med. Jahrb. Wien., 13: 179, 1867.
3. Feré, Chas.: LeProg. Med. Paris, 5: 73, 1877.
4. Castle, O. L.: Annals of Surg., 61: 582, 1915.
5. Corning, E.: Albany Med. Annals, 26: 816, 1905.
6. Mayo, C. W. and Fauster, J. U.: Minn. Med., 15: 254, 1932.
7. Phemister, D. B.: J. A. M. A., 64: 1834, 1915.
Note—A most excellent monograph on the subject has been written by Dodge, G. E.: Ann. Surg., 63: 334, 1916.

IMPROVED POSTOPERATIVE CARE

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Postoperative management of patients with abdominal operations has improved immensely in the past 20 years. Having occasion to compare the postoperative course of patients operated on about 1910 with those of 1930, E. M. Heacock, M. D., F. A. C. S., and the author decided that even though there had been marked improvement, there was still much to be desired. We had been able to reduce the mortality and increase the postoperative comfort of patients with a peritonitis or localized abscess in the abdomen by withholding fluids by mouth and giving sizable amounts of morphine, so we decided to try this management in our abdominal surgery routinely. From the first, our results were very gratifying.

Routinely, up to that time, we had written postoperative orders for saline only if the patient was badly or moderately dehydrated or had an infection. The matter of administration of morphine depended a good bit on the patient's ability to complain, being ordered gr. 1/6 or gr. ¼ P. R. N., and thus the nurse or interne used their own judgment, which was tempered frequently by teachings or ideas that many addicts are born by too generous administration of morphine postoperatively. The most important part of the postoperative treatment was still left entirely to the judgment of the nurse, for we wrote an order

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for "fluids as tolerated". This left the administration of fluids by mouth entirely up to the judgment of the nurse who usually had no criterion upon which to base her judgment on the patient's ability to tolerate fluids, except to give them, and if vomiting ensued, to have fluid withheld another few hours. It has been our experience that patients usually ask for water as soon as they awaken from a general anesthetic, not because of dehydration, but because of the mouth and throat being dry and irritated following the preoperative medication and anesthetic drug. This request for water probably always occurs during the time the patient is still suffering from the postanesthetic nausea and the giving of fluid into the stomach at this time is worse than useless, because the fluid is vomited and the postoperative discomfort caused by this physical effort is immense and the upheaval in the abdomen certainly does not help localize infection or promote hemostasis. It is our opinion also, based on the observation of patients postoperatively, that once vomiting has started, it is likely to recur, and a patient who does not have vomiting in the first day after an anesthetic and operation, because the stomach has been kept empty, will tolerate fluids much more comfortably and freely on the subsequent day than a person who has been given fluids and has been unable to retain them.

With this in mind, it was decided to permit no fluids to be taken by mouth for a minimum of 24 hours after any operation where the abdomen was invaded. Before the 24 hours had passed the patient was observed and at times the period of withholding oral fluids was extended 8 to 24 hours depending on the patient's condition, whether there had been much postoperative nausea, whether there had been vomiting or if there was any evidence of distention. On any operation where the bowel had been traumatized by the removal of appendix, the freeing of adhesions, or by more than the minimum of handling in packing the bowel away from the pelvis, we considered that oral fluids should be withheld 36 hours, with a possibility of extending this period on the same basis as the previously described cases. On all cases where there was infection either from an appendix with exudate or free pus, from a pelvic abscess or possibly from a cervical stump that had not been carefully handled, we found that 48 hours should be the minimum time elapsing before the patient should be permitted to take fluids into the stomach, with a possibility of extending this period another day or even 2 days if it was considered necessary, because of nausea, distention, or gas pains.

During this period in which the patient was not permitted to drink fluids, the dryness of the mouth and throat were relieved by permitting the patient to rinse the mouth freely with cold water or to suck ice chips, but each patient was cautioned not to swallow the fluid. Each patient was talked to, and the purpose of the starvation was explained. They were told that no amount of water that they could drink would completely quench their thirst because the discomfort in the throat and mouth was due to the anesthetic and not due to lack of water; that fluid taken into the stomach would more than likely cause them to vomit and to have gas pains and distention and if they were willing to recognize the dryness in their throats as a minor discomfort that could be almost entirely relieved by rinsing the mouth or sucking ice, that they would more than likely escape with no vomiting or gas pains or distention. It was surprising to see how well patients cooperated and how very few objected.

Much has been written in recent years on the proper provisions of water balance, mineral balance, caloric requirement and maintenance of nutrition in the surgical patient. Coller has called attention to this and has made some very useful contributions to surgery in measuring the fluid loss. We have attempted to provide the patient with at least 3 liters of fluid in the first 24 hours, one liter of this to replace the immediate postoperative fluid loss, which has been estimated at one liter; the other 2 liters at about 8 hour intervals to provide for the normal fluid loss, and on subsequent days have given at least 2 and sometimes 3 liters each 24 hours until oral fluids are permitted. This fluid was administered as normal salt solution which provided 27 gms. sodium chloride during the first 24 hours. Taking 15 gms. as the normal need, the additional salt given during the first day provided for excess chloride loss during surgery and postoperative perspiration. On subsequent days with a 2 liter intake, only 18 gms. of sodium chloride was given to satisfy the 15 gms. normal, so we felt that no patient was being overloaded with sodium chloride.

To each liter of saline solution was added 50

gms. glucose to provide rapidly for caloric requirement, the 150 gms. glucose in the first day providing calories for the patient's immediate needs. Where there was any fear of administering an excess of chloride, we used 5% glucose in sterile water on subsequent days, but we had no patient where edema or nephritis was recognized as being due to excessive chloride administration.

On all of our cases the fluid was administered hypodermically. We have no objection to intravenous administration except that fluids so administered must be properly buffered and the technique is not as simple as the hypodermic method. By using novocaine at the site of injection and with a patient properly under the influence of morphine, we have had very few complaints. Most of our difficulty in this method was due to the occasional slow absorption, but these cases were too few to discard the hypodermic method.

Wolfer has recently called attention to the balanced diet and has shown that dietary deficiencies in the surgical patient are not rare. We have made no provision for vitamin or protein intake in the first few days, believing that we get our patients on a general balanced diet very rapidly by this method as compared to the frequent continued vomiting, distention and discomfort which our patients experienced when oral fluids were administered too soon. As soon as we feel that fluids by mouth can be tolerated, hot tea and water is given in small amounts, the patient being advised to take only small sips at first. In 8 hours, if tea and water are taken freely, general liquids are given. Broth and greasy soups are not encouraged, because of their low nutritive value and great possibility of causing discomfort. Milk and so-called cream soups are encouraged. If the patient tolerates this fluid well for 24 hours, a light diet; puddings, cereal, toast, etc., is given and then by the next meal a general diet is provided if the patient cares for more food.

The question of how much morphine to administer postoperatively is still discussed, but it seems that most surgeons now agree that it is a very useful and humane postoperative drug. We have used no set procedure, believing that an order for morphine gr. 1/6 or gr. ¼ every 6 hours might be excessive for some patients. We ask for its administration P. R. N. freely, advising the nurse to give the first injection when the patient wakens from the anesthetic, and to be guided by two factors; first, the patient must be comfortable; and second, if the respiratory rate falls below 12 to notify the interne or the surgeon. We have had only one case where we felt that morphine caused the respiratory rate to be low and this patient had a respiratory rate of 6 per minute when she came from surgery following resection of an ovarian cyst and appendectomy. Morphine gr. 1/6 had been used preoperatively. She received no more morphine and it is needless to say that it would have been ill-advised to order morphine every 6 hours for this patient and leave her to be cared for by a busy nursing staff who were interested in carrying out the doctor's orders.

We feel that morphine is of value not only because it gives the patient rest and freedom from pain and makes them less aware of outside disturbances, but it is also distinctly an aid in combating intestinal activity. By stimulating the small bowel it evidently maintains sufficient tone to prevent distention and by causing relaxation to the large bowel, the desire to empty the bowel or the sensation of gas pains is prevented. Since the large and small bowel do not both become active at the same time and drugs which stimulate one, relax the other, it would seem that if the small bowel can be maintained in a state of mild stimulation, the large bowel in the meantime being kept at rest, there can be no sensation of wanting to go to stool or to pass gas or large bowel distention. Physiologists may disagree with our our explanation or interpretation, but they cannot well disagree with our clinical observations, that morphine judiciously administered in frequent intervals causes the patient to have a much more comfortable abdomen.

Certainly not many patients become addicts due to postoperative morphine administration. We have felt that a patient who is given sufficient morphine so that she does not need to beg for it, is much less likely to know just how much relief it gives and consequently much less likely to remember vividly what morphine can do.

It has been our practice to avoid if possible giving enemas during the early postoperative period. So frequently an enema designed to give relief is without the desired result and more than occasionally adds to the patient's discomfort. Naturally the injection of fluid into the rectum causes irritation. It is given for the pur-

pose of promoting large bowel activity and we have felt that the less large bowel irritation our patients have, the more comfortable will be their convalescence. Certainly the majority of surgeons have discarded the high pressure irrigations designed to force fluids across the transverse colon and use instead where they feel that an enema is necessary a low relatively nonirritating rectal instillation or a return flow mechanism so no pressure is exerted high in the colon. Colonic flushings are difficult enough to tolerate when the patient is in good health and to subject a patient recently operated on to this procedure without being able to promise great relief seems barbaric.

We have used a rectal tube for the relief of pressure by gas when the patient has lower bowel discomfort. Usually about the third or fourth day as the morphine is gradually withdrawn, the patient may have a spontaneous bowel movement. If not, we do not hesitate to wait another day and then if the bowels have not moved, a low enema is given, almost always with excellent results. Following this, daily low enemas or mild cathartics are used, the comfort of the patient being the governing factor.

Proctoclyosis or rectal feedings have had no place in our recent treatment. There is considerable doubt if much nutrient material is absorbed and certainly the discomfort of the procedure, the difficulty with which a successful instillation can be made, and the irritation to the large bowel are enough to discourage this method of administering fluid and food when there are other easier methods.

In adopting this method of treatment we have felt that we are aiding and cooperating with the natural body forces to bring about recovery. In every case of intestinal infection or trauma, nausea and vomiting are usually the first symptoms to appear. The body forces are aimed at getting the stomach empty and keeping it so. Why should we encourage the patient to fill her stomach before this period is passed? In every case of abdominal infection the natural forces cause the bowel to be quiet. An abdomen with peritonitis or local abscess is a silent abdomen. Why should we encourage activity by feeding and by enemas? Rather, we should encourage rest, which we atempt to do by morphine. Then when the necessity for an empty stomach and a quiet bowel is past, the patient can logically be brought along more rapidly toward a full general diet.

In only one case of a fairly large series have we found it necessary to use a duodenal siphon drainage tube. The procedure certainly gives excellent results and we would never hesitate in its use, but so few of our cases have had distention of more than a very moderate amount and so rarely do they have vomiting that we have felt that the installation of duodenal suction drainage with its moderate discomfort, its more or less large amount of equipment should be avoided if abdominal comfort can be obtained by simpler methods.

In fact, it is the simplicity of the method that we advocate, that makes it difficult for us to impress the average surgeon that he is treating his cases any different than we do ours. Most men use saline and glucose, nearly all have morphine given, very rarely does any one order an enema soon after operation and fluids by mouth are always withheld for a time. If we could only develop some complicated scheme or apparatus to sell our method, more attention would be given to postoperative care. But try as we might, we have been unable to make the provision of postoperative comfort spectacular and consequently have had only very few converts. We feel that regardless of the method used, a patient is entitled to comfort, and in the vast majority of instances it can be provided by a simple commonsense application of general principles, and if the surgeon would apply himself as conscientiously to provide comfort for his patient after surgery as he does to doing nice operating, both he and the patient will have fewer postoperative headaches.

I am presenting two series of cases. In each series the cases are consecutive abdominal operations but there is a lapse of about 50 cases between the two series because it took considerable time and teaching of nursing staff and internes to get complete cooperation.

In the first series fluid was given when the nurse or intern felt that it might be tolerated. In the second series it was withheld by mouth for a definite and longer period of time. In the first series, postoperative vomiting was expected, in the second series it was hoped that no vomiting would occur. In the first series we expected distention and gas pains, in the second series we usually found them absent or very mild. A

presentation by table does not begin to do justice to the dramatic difference in the comfort of the patients in the two groups. The second series could be made to look much better if it were taken at the present date instead of several years ago, because even with careful watching and instruction of nurses, many a busy night nurse would give the patient a glass of water and read the orders on the chart afterwards and thus occasionally upset the routine. It was felt, however, that this presentation should include two series relatively near together so that improved anesthesia, operating room technique and hospital management should not effect the difference.

Only fifty cases are presented in each series, the percentages by comparison are the same as for larger groups in each series and the presentation is easier.

KEY TO OPERATIONS

1. Acute Appendicitis
2. Interval Appendectomy
3. Hysterectomy
4. Oophorectomy
5. Salpingectomy
6. Pelvic Abscess
7. Strangulated Hernia
8. Cholecystectomy

TABLE 1, SERIES 1

Operation	Patient	Min. Spent in Operating	Hours Oral Fluid Withheld	Liters of Saline	Liters of Proc.	Amt. of Morphia	Gas Pains	No. of Attacks of Vomiting	Post Op. Distention	Days Until Enema or Spont. B.M.	Hosp. Days Post. Op.
1	B.W.	48	5	0	1	0	xx	0	xx	2	11
1	E.S.	30	10	1	1	3/6	xx	0	0	2	11
1	L.G.	60	10	0	1	ℓ/6	xx	x	0	1	13
1	F.J.	18	1	0	0	3/6	xx	0	x	3	17
2, 4, 5	A. K.	45	12	1	4	3/6	xxxx	xxx	xxx	1½	16
1	C.M.	45	10	1	0	0	xxx	0	xx	2	14
1	C.M.	35	6	0	2	1/8	xxx	x	xx	1	10
1	E.B.	25	8	0	3	1/6	xx	x	xx	1½	14
1	G.E.	30	6	0	2	3/8	xxxx	xxx	xxx	3	15
1	L.B.	40	7	1	2	2/6	xxx	0	xx	1½	13
3, 4, 5	H.J.	96	3	1	2	6/6	xxx	xx	xxx	3	14
6	L.S.	35	3	3	1	6/6	xxxx	0	xx	1½	24
2, 4, 5	I.S.	55	7	1	2	4/6	xxxx	xx	xxx	3	18
1	J.S.	25	7	1	2	3/8	xxx	xx	xx	2	23
4	E.H.	37	10	1	2	2/6	xx	xx	xx	2	13
2, 5	J.M.	55	4	1	1	3/6	xxx	x	xx	1	13
7	W.A.	55	5	1	1	0	x	xx	x	1	14
2, 4, 5	A.R.	50	4	1	2	3/6	xxx	0	xxx	2½	16
5, 4	F.J.	60	4	2	1	ℓ/8	xxx	xxxx	xxxx	1½	18
1	S.S.	30	6	0	1	0	xx	x	xx	1	12
4	I.M.	30	2	0	1	2/6	xxxx	xxxx	xxxx	1	14
2, 4, 5	M.M.	70	3	1	2	3/6	xxx	x	xxxx	1	14
1	N.R.	28	5	1	0	0	xx	xxxx	xx	3½	10
2, 3, 4	H.S.	54	5	1	1	6/6	xxxx	xxxx	xxxx	1	22
1	E.A.	30	6	1	0	3/6	xx	xxx	xx	2½	14
1	V.B.	18	18	1	1	4/6	xx	xx	xx	2	14
2, 4	A.H.	50	5	1	1	3/6	xxxx	xxxx	xx	1	17
1	V.S.	26	6	0	1	0	xxx	xxx	xx	2	10
4, 5, 6	E.S.	60	3	2	0	9/6	xx	x	x	1½	20
1	B.C.	20	5	1	0	0	xx	x	0	1	10
1	H.H.	30	7	1	1	2/6	0	x	0	1½	12
3, 4, 5	E.N.	65	6	1	1	2/6	xxx	xx	xxx	1½	20
1	E.S.	22	5	1	2	0	xx	xx	0	2	12
2, 5	M.H.	30	1	2	0	4/6	xx	0	xx	3	17
2, 4	E.M.	40	4	0	1	3/6	xx	xx	xx	2	14
1	M.C.	40	8	0	1	ℓ/6	xxx	xx	xx	2	11
1	A.L.	30	12	1	0	3/8	xx	x	0	2	13
3	K.M.	75	5	1	2	2/4	xxx	xxx	xxx	1	19
2, 4	M.G.	30	10	0	1	1/6	x	xx	0	2	14
4, 5	L.W.	60	12	1	1	4/6	x	x	x	1	14
2, 4, 5	V.W.	60	8	1	1	3/6	xx	xx	xxx	2	12
1	A.G.	35	8	0	1	2/6	xx	0	xx	2	11
1	E.T.	26	9	0	1	3/6	xxx	0	xxx	1	12
1	M.R.	40	6	0	1	2/6	xx	xxx	xx	2	14
1	C.B.	25	9	0	2	3/6	xxxx	0	xx	2	12
1	G.L.	38	5	1	1	0	xx	0	xx	2	14
2, D&C	M.K.	70	18	1	1	1/6	x	0	x	S1	21
5	M.H.	40	2	0	2	3/6	xx	xx	xx	4	22
1, 4	P.C.	65	18	0	1	3/6	xx	xxx	xx	4	14
3	S.M.	70	12	1	1	0	xx	xxx	x	2½	20

TABLE 2, SERIES 2

Operation	Patient	Min. Spent in Operation	Hours Oral Fluid Withheld	Liters of Saline	Liters of Proc.	Amount of Morphine	Gas Pain	No. of Attacks of Vomiting	Post. Op. Distention	Days Until Enema or Spont. B. M	Hosp. Day Post. Op.
1	A.M.	45	24	3	0	3/6	x	0	x	6	15
5	C.L.	35	24	2	0	3/6	x	0	0	5	15
1	A.G.	40	20	2	0	3/6	x	0	x	4	13
1	F.W.	35	22	2	0	5/6	xx	0	0	4	10
3	A.E.	70	24	3	0	8/6	x	0	xx	2	23
8	M.G.	50	30	3	0	4/6	x	0	x	5	18
1	E.K.	45	40	6	0	7/4	xx	0	x	5	20
1	M.S.	50	24	3	0	2/6	xx	x	0	3	10
2, 8	E.S.	55	8	3	0	5/6	x	xxx	x	3	18
1	W.R.	20	36	3	0	5/6	x	0	x	6	29
1, 7	C.S.	70	36	5	0	8/6	0	0	0	S6	16
1	E.K.	25	48	5	0	5/6	x	0	0	3	12
2	V.F.	50	10	1	0	5/6	xxxx	xx	xx	3	14
2, 8	M.T.	70	40	5	0	4/6	xx	xx	0	3	14
1	C.D.	20	12	2	0	3/6	xxx	x	xx	2	12
2, 3, 4, 5	V.D.	65	10	5	0	6/6	xxxx	xx	xxx	4	15
1	M.M.	30	15	2	0	3/6	0	0	0	4	11
7	G.R.	35	2	0	0	2/4	x	x	0	S3	13
2, 5	M.R.	45	32	3	0	5/6	xx	0	0	5	12
1	E.R.	35	24	2	0	0	0	0	0	5	10
3, 4, 5	D.S.	70	24	3	0	4/6	xx	0	xxx	2	18
1	M.U.	40	72	10	-0	8/6	0	0	0	4	28
7	S.M.	45	24	4	0	6/6	x	x	0	4	20
4, 5	F.T.	45	48	5	0	4/6	0	0	0	3	16
4, 5	M.M.	30	7	2	0	4/6	xx	xx	xx	2	14
2, 4	E.K.	35	32	3	0	4/6	x	0	x	2	14
1, 4	J.M.	70	10	1	0	3/8	xx	0	0	2	11
8	A.W.	60	11	2	0	5/6	x	0	x	2	14
4, 5	J.W.	50	34	4	0	3/6	1	0	xx	2	10
1	G.T.	35	30	3	0	2/6	x	xx	0	3	9
8	K.S.	65	30	5	0	6/6	0	0	0	2	21
1	E.H.	40	48	3	0	1/6	0	x	0	2	10
2, 4, 5	D.O.	35	4	1	0	4/6	xxxx	xx	xx	2	12
1	L.B.	40	50	4	0	3/6	x	0	0	5	14
4, 5	A.Y.	60	30	4	0	4/6	xx	x	x	3	16
1	J.K.	50	50	6	0	7/6	x	0	0	7	21
1	M.L.	15	36	4	0	4/6	x	0	x	4	14
1	G.S.	30	40	5	0	5/6	0	x	xx	5	21
3	G.S.	65	48	6	0	7/6	0	0	0	4	14
3	E.W.	70	48	6	0	6/6	x	0	0	4	16
8	R.S.	60	50	6	0	4/6	x	0	x	5	20
3, 4, 5	M.S.	30	36	4	0	5/4	xx	x	x	4	15
1	L.D.	25	48	5	0	4/6	x	x	x	3	10
1	W.K.	25	48	6	0	6/6	x	0	0	4	8
1	A.T.	35	52	6	0	5/4	0	x	0	3	14
1	E.H.	35	36	4	0	4/4	x	0	xx	4	10
2, 4, 5	E.S.	35	50	6	0	5/6	0	0	x	4	13
1	L.T.	25	52	6	0	4/6	0	x	0	3	10
1	L.O.	30	40	4	0	5/6	x	0	0	4	10
1	A.G.	35	52	6	0	6/6	0	x	x	5	11

TABLE 3, SUMMARY

APPROXIMATE AVERAGES ARE GIVEN

Series	Hours until oral fluid	Liters Glu. & Saline	Liters Procto.	Amt. M.S.	Gas Pns.	Vom. No. Att.	P. O. Dist.	Days before Enema	Hosp. days P. O.
I	7	1	1⅗	⅜	2⅜	1⅜	2	2	15
II	33	4	0	⅛	1⅛	½	1	4	15

In the two series covering relatively similar operations, the difference in postoperative comfort measured in distention, gas pains and attacks of vomiting is striking. The actual difference however, is greater than can be shown in a table made up strictly from the nurses' records. Gas pains as recorded here cannot be recorded according to their severity, so we have tabulated the number of times that the nurse has made a record of the patient's complaint. From the clinical observations we have observed that the distress has been much less in the second series. Similarly with the attacks of vomiting; they were much less severe in the latter series so that a figure of 1 3/5 in Series 1 compared to ½ in

Series 2 does not give a true comparison, but the difference is sufficient, based on these figures, to justify the newer method. Distention here has been recorded from the number of times it was noted in the nurses' record and the ratio is 2 to 1. Actually, however, the severity from our observations has also been greatly reduced. From the averages, it will be noticed in Series 2 that gas pains, distention and attacks of vomiting have been reduced to one-half of the figures in Series 1; the hours for withholding oral fluids have gone up from an average of 7 to an average of 33. Liters of saline or saline with glucose have gone up from a minus 1 to 4; no proctoclysis was given in Series 2; an average of 1 1/5 liters appears in Series 1. Morphine administration has doubled from an average of 2/5 gr. to 4/5 gr. The number of days before an enema was given has doubled. So speaking relatively, by withholding oral fluids 26 hours longer than formerly, doubling the amount of saline and glucose, doubling the amount of morphine and doubling the number of days that enemas were not given, we have been able to divide by 2 the attacks of vomiting, the frequency of gas pains and the distention.

The postoperative hospital stay in these two series is exactly the same, partly this was due to the habit of keeping a patient about a certain length of time. We have now reduced these figures and have thus added economic comfort to the list of benefits.

One other benefit we should like to add to this list and if it has any basis it will certainly be of extreme importance. If worry and tension and hearing complaints are reflected in the coronary vessels, then certainly we should benefit, for it has been our experience that when the patient is comfortable, the surgeon can sleep.

BIBLIOGRAPHY

Stewart, J. D.: Fluid Therapy in Surgery-Critical Review. *New Eng. J. Med., 215: 53, 1936.*

Coller, F. A.: Water Balance of Sick Patients. Wis. M. J., *35: 618, 1936.*

Coller, F. A.: Water Balance, Dehydration and Administration of Parenteral Fluids. Minn. Med., **19**: 490, 1936.

Coller, F. A., Maddock, W. G.: Water Requirement of Surgical Patients. Anaesth. and Analg., **14**: 140, 1935.

Coller, F. A.: *Water Balance in Surgical Patients. Neb. St. M. J., 20: 365, 1935.*

Wolfer, J. A.: A Consideration of the Nutritional Status of *the Surgical Patient. S. G. O.*, **63**: *607, 1936.*

Constantini and Ballarin: Abs. S. G. O. Research of Intestinal Peristalsis—The action of various salts injected i. v. Arch. ital di chir, **39**: 401, 1935.

Coller, F. A., Dick, V. S., Maddock, W. G.: Maintainance of Normal Water Exchange with i. v. Fluids. *J. A. M. A.*, **107**: 1522, 1936.

Plank, J. R.: Postoperative Treatment Based on Physiologic Principles. Colo. Med., **33**: 465, 1936.

Fantus, B.: Fluid Postoperatively, Especially Dext. and Sod. Chlor. Statistical Study. J. A. M. A., **107**: 14-17, 1936.

Hyman, H. T., Touroff, A. S. W.: Therapeutics of Intravenous Drip-Further Observations. J. A. M. A., **104**: 446, 1935.

Curpley, W. C.: Dilatation of the Stomach. J. Kan. Med. Soc., **36**: 68, 1935.

DISCUSSION

Dr. Otto S. Pavlik, Chicago: The water balance that has been discussed so much of late all over the country is nothing new. I remember back in 1904 when I was one of Professor Dudley's assistants in the operating room, we used to fill the abdomen with saline solution. We had to hold up the sides of the abdomen to keep the fluid in while Dudley did the suturing. About that time Murphy came out with his Murphy drip-proctoclysis. Of course it was crude when compared with the present way of giving fluids. The credit for this work belongs to the men at Ann Arbor who for the last two or three years have worked it out on a scientific basis.

The preparation of the patient before operation is important. When you consider the withdrawal of fluids, before the operation, the loss by perspiration during the operation and in a warm bed following, they should receive enough fluid in one way or another to make up the loss, to maintain the water balance.

As to giving morphine, for over thirty years I have used morphine as freely as indications arose and I have never seen an addict. I have never had a patient cry for morphine. There were times I did think the patient wanted morphine and I gave a sterile injection and she was satisfied, showing that the direct indication for morphine was not there.

As far as the bowels are concerned, for years I have given patients forty-eight hours after operation milk of magnesia, one ounce every half hour for three doses and six hours later an enema. I have found no reason to change. This is not original with me; I have seen it used by other men.

I believe this discussion of the after-care of patients is very timely and we should have it occasionally to bring out new ideas.

SOME PHYSICAL ASPECTS OF RADIATION THERAPY

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During the course of my work I am frequently asked about the most satisfactory voltage or filter or distance to be used in therapeutic procedure. It will by my purpose, in this paper, to attempt to answer these and similar questions, at least so far as it is possible from a physical standpoint.

The aim in deep therapy seems to be to get as much radiation to the tumor as possible. In-

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creasing the depth dose delivered to the tumor can be accomplished by adjusting certain of the factors in technique which are under our control. Thus an increase in voltage produces greater penetration. However, for each increase in a factor improving depth dose, there is a corresponding undesirable change of some form or other. The increase in voltage is limited by enormously increasing monetary costs. An indefinite increase in filter is halted by an uneconomical increase in treatment time. It will be the purpose of this paper to show the logical limits to which variations in these factors may be carried.

Percentage depth dose is increased by decreasing the wave length of the radiation, by increasing the distance of the tube from the patient and by increasing the area being radiated. Wave length, in turn, may be decreased by increasing either voltage or filter or both.

We will discuss the relation of wave length to depth dose first. In the early days of deep therapy, all generators were of the simple full wave rectified type, and all x-ray tubes were of one style, made by one manufacturer. Under these conditions, a bare statement of the peak kilovoltage, as measured by a sphere gap, and the filtration, gave a sufficiently correct estimate of the quality of the radiation being used. Today the picture is different. There are full wave and half wave, voltage doubling unrectified, with and without grid bias control, constant potential and other types of generators. There are thin walled and thick walled, oil immersed and air insulated x-ray tubes. The inherent filtration built into the modern shockproof x-ray tube stand varies from a few millimeters of aluminum to as much as six-tenths of a millimeter of copper. The combination of all these unknown variables makes it impossible to specify radiation quality by a mere statement of the voltage and the filter. Radiation quality must be specified by some sort of measurement on the x-ray beam itself. The determination and statement of effective wave length is one such method. The effective wave length of an x-ray beam is the wave length of that monochromatic beam which would have the same degree of penetrability as the beam in use. The actual beam in use is always hetrogeneous—that is, is composed of various wave lengths. Despite this fact, the radiation will penetrate a given body to a certain degree. It is possible to conceive of, although not actually to produce, a beam of entirely monochromatic radiation—that is, a beam composed of x-rays of only one wave length. Let us adjust a hypothetical x-ray generator so that it will produce a monochromatic beam which will penetrate a given body to the same degree as the beam we are actually using for treatment. The wave length of this imaginary monochromatic beam is said to be the effective wave length of the beam we are using. The harder or more penetrating the radiation, the smaller will be the numerical value of this effective wave length,

Table 1 shows some effective wave length values:

Peak Kilovolts	Filter	Effective Wave Length
90	0	0.80
100	1mm.Al.	0.40
120	3mm.Al.	0.28
140	¼Cu+1Al.	0.20
200	½Cu+1Al.	0.150
200	1Cu+1Al.	0.140
200	Thoraeus	0.130
200	5Cu+1Al.	0.90
Radium	Platinum	0.010

A second method of specifying radiation quality is the half value layer method. The half value layer is the thickness in millimeters of a filter necessary to decrease the intensity of the beam being used to one-half. It is obvious that it would take less copper to halve the radiation intensity of a beam of soft radiation, generated at 90 kilovolts and unfiltered, than it would of a beam of hard radiation, generated at two hundred thousand volts and filtered through two millimeters of copper. For x-radiation generated at less than 140 peak kilovots, and filtered by less than ½mm copper, aluminum is usually used as the auxiliary filter material, and the half value layer is expressed in millimeters of aluminum. For radiation up to about 400 peak kilovolts copper is used, and for radiation generated at still higher voltages, the half value layer is expressed in millimeters of tin or lead. The choice of various materials is principally a matter of convenience. If aluminum only were used for the entire range, it would be necessary to use too great thicknesses for the higher voltages, both from the standpoint of difficulty in handling, and from the scattering effect. If lead were used throughout, the thicknesses for the less penetrating radiation would be so small

that accuracy would be sacrificed. Table 2 shows some approximate half value layers:

Peak Kilovolts	Filter	Half Value Layer
90	0	0.50mm.Al.
100	1mm.Al.	1.5mm.Al.
120	3mm.Al.	4.0mm.Al.
140	½Cu+1Al.	9.0mm.Al.
200	½Cu+1Al.	0.m.Cu or 13mm.Al.
200	1Cu+1Al.	1.0mm.Cu
200	Thoraeus	1.4mm.Cu
200	5Cu+1Al.	2.65mm.Cu
400	6Cu+1Al.	5.0mm.Cu

The above two methods of expressing quality give numerical values which are very gratifying to our human desire to express quantities by numerical indices. However, these figures mean very little until we learn to evaluate them in terms of some clinical entity. If you did not know that approximately 700 roentgens constitute an erythema dose, it would not mean much to you to know that someone administered 200 "r" to an area. Similarly with half value layer and effective wave length. We must correlate these figures with something which has a clinical significance before we can use them. Depth dose measurements, in a phantom of water or rice give us a clinical foundation. Thus if I say to you that the effective wave length of x-rays generated at a certain machine setting is 0.15 Angstrom units, it does not mean nearly as much to you as if I say that at 10 centimeters depth, the depth dose is 40 per cent. of the surface dose. One of the serious drawbacks to either half value layer or effective wave length is that their numerical values promise much better depth dose than is actually realized. Thus changing from ½mm copper to 5 mm copper at 200 peak kilovolts increases the half value layer from 0.9 mm copper to 2.65 mm copper. On the face of it this appears like a startling increase in quality. Yet in terms of increased depth dose it amounts to not more than three or four per cent. The reason for this disparity is that no matter how hard the original radiation, the average wave length is degraded or lengthened as it is scattered in tissue. Thus we must be cautious about the use of quality measurements made on a beam in open air, and remember that a beam is utterly transformed as it passes through tissue.

After this rather extended digression about quality, let us see how it is affected by the factors of type of generator, filter and voltage.

As stated above, there are many types of generators on the market at the present time. My experience would indicate that from a standpoint of radiation quality delivered, they may be divided into three groups. The best radiation quality would be obtained from the constant potential type. The next best from the type employing a negative grid bias on the x-ray tube. The last group would include the full and half wave and Villard (voltage doubling) circuits. There is little to choose from among the three in this group at least from a standpoint of radiation quality.

Increase in voltage produces better depth dose, but only slightly. Table 3 shows this increase:

Voltage	% Depth Dose
200 PKV	47.8
250	48.7
300	49.5
350	49.9
380	50.1

½Cu+1Al—50 CM Distance
20 x 20 CM Field

I do not have accurate personally obtained data available for voltages higher than 380 peak kilovolts, but I do not think that the value would be more than 55% at 600 peak kilovolts with a filter of as much as 7 millimeters of copper. Since the original cost and upkeep rise enormously with increases of voltage over 200 peak, and since the increase in depth dose is small, it would appear that from a physical depth dose standpoint only, the super high voltages would be uneconomical. Please bear in mind that I have qualified the above statement to a depth dose basis only. Whether or not there is a different biological reaction to the higher voltage is an altogether separate question, and is one which I am of course not prepared to discuss.

For voltages about 200 peak kilovolts, copper filters backed by aluminum are most commonly used in this country. There is a tendency at the present time to use composite filters, the principal filtering material of which is tin. It was shown by Robert Thoraeus at the Radium Hemmet in Stockholm several years ago that a filter composed of a layer of 0.44 mm Tin plus a layer of 0.25 mm Copper plus a layer of 1.0 mm Aluminum would transmit the same intensity (roentgens per minute) as 2 millimeters of copper. However, the quality (effective wave length) of this transmitted radiation was the same as that which would have been transmitted by 3 millimeters of copper. In other words, this filter is more efficient than copper. This increase in efficiency is only significant at voltages of 200

peak kilovolts or higher. The efficiency of a filter is a function of the voltage at which the x-rays it is filtering are generated. Thus at low voltages, aluminum is more efficient than copper, and at high voltages copper is more efficient than aluminum. At still higher voltages, tin is more efficient than copper, and at extremely high voltages, lead is better than tin. There have been several modifications of the original Thoraeus filter; some containing less, and some more tin. One of the more recently suggested composite filters is that described by Merritt in a recent issue of the *American Journal of Roentgenology*. He uses 1.2 mm Tin + 0.25 mm Copper + 1.0 mm Aluminum. This filter transmits the same quality as does five millimeters of copper but a considerably greater number of roentgens per minute than 5 millimeters of copper.

As the filter thickness increases, there is a rather slight increase in depth dose. Table 4 shows some typical values:

Filter Material	Thickness	% Depth Dose	"r" Per Minute
Copper	½mm.	38	42
Copper	1mm.	41	27
Copper	2mm.	42	16
Thoraeus		43	17

200 PKV—15x15cm Port—50 CM Distance.

These figures show that in order to obtain a 5% increase in depth dose, the treatment time must be increased 252%. This is apparently a most uneconomical procedure, and on the basis of physical findings alone would certainly be unjustified. When deep therapy was first introduced into this country in 1921, one millimeter of copper was used almost universally. As more and more depth dose measurements were made, and it was perceived that the depth dose with one millimeter of copper was only very slightly greater than that with ½ millimeter, there was a gradual shift to less filtration, until in the late twenties and early thirties most of the deep therapy work was done with ½ mm copper. However, it began to be noted, principally I believe as a result of Coutard's work, that with heavier filters, the skin tolerance was greater. Greater doses could be given with the same skin effect, or the same dose given with less skin effect as the filter thickness was increased. Doses which in the past would have been undreamed of are today routine with the heavier filters. Five or six erythemas (5000 r) in a period of twenty days are not uncommon—and this to large areas. I think that for ordinary use two filters might advantageously be employed for deep therapy; ½ mm copper and the Thoraeus filter, equivalent to 2 mm copper; the half millimeter copper to be used in the less involved cases, or where treatment time must be limited. The Thoraeus filter to be used where the greatest amount of radiation is required, where the patient is particularly thick, and where treatment time is not of great importance.

There is one point that I would like to call to your attention briefly in passing. Clinically there is no doubt that as the radiation gets harder (increased filter) the skin's tolerance increases. However, in general as the radiation gets harder another factor changes along with it. This factor is rate or "r" per minute. In other words, as an almost inherent characteristic of increasing the hardness is a concomitant decrease in rate. It may possibly be that the apparent increase in skin tolerance is not due to increased hardness but is due to the slower rate of application of the radiation. Hodges has shown that on the skin of rabbits, equal doses of x-rays given in equal times produce the same effects regardless of whether the radiation is hard or soft. The work of Wood and his co-workers in New York indicates this same result. Coutard, as a principal axiom of his method, insists on a slow rate of application. I do not mean the fractionation of the treatment over a period of many days, but the protraction of each individual treatment over several hours. His results with a low "r" per minute, obtained with low milliamperage and 2 millimeters of copper may be paralled by Merritt with high milliamperage, 5 millimeters of copper and an approximately corresponding low "r" per minute. The filter may have nothing to do with it. In other words, we have one result with two variables: filter and rate, and it will undoubtedly take considerably more confirmatory evidence on one side or the other before it can assuredly be said which it is: the filter or the rate.

Up to a certain point increasing distance is probably the most efficient way of increasing percentage depth dose. Quimby showed a year or so ago that while it took nine times as long to increase the depth dose 6% by adding filters, it took only four times the time to get the equivalent effect by increasing distance. Table 5 shows

what may be expected from an increase of distance:

Distance	% Depth Dose	"r" Per Minute
50	42	100
60	44	70
70	46	50
80	47	39
100	49	25

Two distances may well be used as standard in deep therapy. Fifty and 70 centimeters. There is some work being done at 80 cm but in the ordinary installation it is hardly justified.

Increasing the size of field treated very materially increases the percentage depth dose due to increased scattering from the surrounding tissues. However, size of field is usually determined by the clinical and anatomical features of the case rather than by the desire to get the greatest possible depth dose. As a rule, all other factors being the same, the largest possible field should be used. Table 6 shows the effect of field size on percentage depth dose:

Field Size	% Depth Dose
5x5 cm	28
10x10	37
15x15	42
20x20	43

A rather general standard technique is 200 peak kilovolts, ½ mm. Copper, 50 cm distance and a 15x15 cm field. With this technique, we can assume a 40% depth dose at 10 centimeters depth. An increase of filter from ½ mm Copper to the Thoraeus filter; from 50 to 80 centimeter distance; from a 15x15 field to 20x20, and from a pulsating generator to a constant potential will increase the depth dose from 40% to 52%. At the same time, it will decrease the number of "r" per minute from 13 to 4.5. Thus you can see, that although changing any one factor produces relatively small changes in depth dose, the summation of all possible changes gives an increase of significant proportions. In the one case, a tumor being radiated from four fields, would receive a total of 1600 "r" for every 1000 "r" given each skin area. In the other case it would receive 2100 "r" for the same skin dose.

Somewhat aside from the main thesis of this paper, but of such considerable interest that I feel that it should be brought up, is the problem of measuring dosage with or without backscatter. Which method should be employed. If I place the ionization chamber of my measuring instrument 50 cm from the x-ray tube in open air, the instrument will measure a certain number of "r" per minute, say, 10. Now, if I keep all conditions the same except place under the ionization chamber a block of paraffin, the registration of the meter will be about 15 instead of 10. This increase in reading is due to radiation being scattered back from the paraffin block adding itself to the effect of the direct radiation on the ionization chamber. It is much the same effect as if you held your hand out in a driving rain. It would get wet on the top side only. If, however, you held it an inch or so above the sidewalk, the under side of the hand would get wet from the rain which hit the sidewalk and splashed back. The patient under the x-ray tube makes a very good backscattering agent. You may well say that if I measure the dosage with the ionization chamber in free air it will not be the same dosage as the skin of the patient is receiving. That is perfectly true. For 200 kilovolt therapy and with a large field, this difference amounts to about 45%. Why then, do most American physicists prefer to measure in air when the measurements are apparently 45% too low? The answer is that air measurements can be made with considerably greater accuracy. Then a definite known correction can be applied to reduce the values to backscatter values, if desired. As far as dosage goes, the answer will be the same, no mater which way the measurements are made. Suppose that I measure in air and obtain 10 "r" per minute. I will tell you that the number of "r" for an erythema, if measured in air, and then applied to a large field, is 800. Therefore, the erythema time is 80 minutes. If I measured with backscattering, I would measure not 10 but 14 "r" per minute. I would then tell you that, as so measured, it would take 1100 "r" for an erythema, and the treatment time would of course still be 80 minutes. From a practical standpoint, the air measurements are easier to make and are less dependent on variable surrounding conditions. However, the important point is that we must all talk the same language. We must come to a common agreement and then adhere to its usage—either to measure in air or with backscatter. Because there has been no definite authoratative ruling on the question, it is still not possible to duplicate dosage given in about half the journal articles. An author states that he gave 200 "r" per day, and says no word as to how the measurements were made. If you are giving 200 "r" per day measured in

air, you are not giving the same amount at all as the author of an article if he meant 200 "r" per day counting backscatter. That would be only 140 as you measure. It is easy to see that serious over or under dosage might result from a misunderstanding on this point. Since the majority of physicists and radiologists in this country are measuring in air I would like to ask that in papers which you present, or in dosage communications which you send to other radiologists, that you give the dosage in air and so state.

DISCUSSION

Roy Kegerreis, M. D., Oak Park, Illinois: The considerations which Dr. Landauer has discussed are among the most complicated and involved of any with which we have to deal. He has done very well in helping to clarify them.

The discussion applies to you and me in two ways:

1. What apparatus to purchase, and
2. How to operate existing apparatus.

The specification of the physical quality of radiation is complicated and is done completely only when the spectrum is presented. Other short cuts, as the speaker has so well emphasized, always leave out a part of the complete specification, so great care must be used always to realize fully just what limitations are and are not included when quality is designated.

The excessive thickness of an aluminum filter which is required for high voltage x-rays and the mechanical weakness of an appropriately thin film of lead for low voltage x-rays are not the only reasons for the limitation of the range over which these two and the other filter substances are used. The elements aluminum, copper, tin and lead, it might not be amiss to point out, have atomic weights roughly twice each other in an ascending scale. The reason for their employment as filters for the x-ray spectra with which they are used is that the wave lengths at which their characteristic x-ray absorption occurs is conveniently spaced. Because of this each filter material most efficiently absorbs the undesirable portion of the spectrum.

Considerably less than one millimeter thickness of aluminum is sufficient to absorb the secondary x-rays that issue from a superposed copper filter for the ordinary purposes of x-ray therapy. Usage began with the one millimeter aluminum filter and usage in the practice of medicine is prone to change but slowly.

The words Dr. Landauer used "transformed as it passes through the tissues" were first thoroughly demonstrated and explained by our American Nobel laurate, Dr. Compton. Multiple scattering with a consistently increased wave length results when the x-rays pass through the tissues. However, be assured that a statement of so and so many r-units is a specification of the thing which is absorbed.

The number of r-units in air will probably stand as the accepted quantity to be measured. Most people infer it when specifying x-radiation dosage on the surface. The area irradiated and the conditions involved in connection with back scatter should always be completely specified if measurements which include backscatter are reported.

HETEROTOPIC INDEPENDENT ADENOMYOMATOUS TUMORS OF THE FEMALE PELVIS

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Independent tumors of the female pelvis and lower abdominal cavity are comparatively rare. The architectural formation grossly as well as histologically and the small account of symptoms exhibited by the patients make these growths pathological curiosities. We report four cases of almost identical type with the theorectical considerations concerning the structure and growth of these peculiar tumors.

The following reference table shows noteworthy observations of the four cases on bloc.

Clinical Picture. Uniformly the symptoms described by the patients seemed to be rather vague. Pressure symptoms and "gas pains", eventually frequency in urination as well as low bachache were given as the main complaints. Irregular menstruation or metrorrhagia were not present. Other typical symptoms could not be described by the patients.

The pre-operative diagnosis in every one of these cases was inexact. In three cases ovarian cyst or tumor was anticipated, and in one case a fibroid uterus. In surveying the literature practically every author reports the astonishing fact that a correct diagnosis could not be stated before operation.

Gross Pathology. The tumors found in these cases were comparatively voluminous, varying from man's fist to man's head size. The consistency was generally hard, the color (in situ) from white-gray to pinkish-gray. The surfaces were smooth, covered with serosa, save the very small fibrous attachments to either the pelvic floor or sigmoid, respectively. Three of the tumors appeared as absolutely round, globe-shaped, and one was of compound structure with several globe spheres. The cut section surfaces were not uniform in structure. Parts of the growths showed sieve-like perforations and tube-like

Name	Year	Age	History	Symptoms	Clinical Diagnosis	Gross Findings	Microscopic Examination	Weight of Tumor
E. F.	1920	36		Abnormal intra-abdominal pressure	Left ovarian cyst	Man's fist sized, hard, pinkish-gray tumor with thin elongated pedicle, freely movable about entire pelvic region; pedicle loosely fastened to left ovary; mass poor in blood vessels; cut section shows lobulated somewhat protruding areas.	Fibromyoma	242 gm.
A. F.	1934	34	Repeated gastro-intestinal treatments	Pressure on both sides of lower abdomen	Cyst of left ovary and tube	Almost man's head sized tumor of reddish-gray appearance; lobulation into four large equal parts; cut section shows hard, striated tissue with softened red and cystic areas.	Adenomyoma	1350 gm.
J. R.	1934	34	Repeated gastro-intestinal attacks; appendix removed in 1932	Numbness in back and left leg, lower abdominal discomfort	Fibroid uterus	Man's fist sized, hard, grayish tumor connected to serosa of anterior wall of abdomen by thin adhesions, adhesions to omentum, small intestines; cut sections show grooves and fibrous cords, softened red sanguinolent cystic areas.	Cystic adenomyoma	1800 gm.
L. S.	1934	50	Repeated gastro-intestinal attacks	Lower abdominal pressure "gas pain"	Torsion of right ovarian cyst	Man's head sized tumor of reddish gray color with intact serosa except for thin attachment to ascending colon; cut section light yellow striation, small lobulations, hemorrhagic, cystic and friable cavities.	Hemorrhagic, somewhat necrotic adenomyoma	1800 gm.

cavities; others were almost dry with the typical reddish-gray appearance of the myoma, and again other regions were soft, myxomatously degenerated and, contrary to latter areas, others almost stone-like hard.

Nearly all stages of metamorphosis were found grossly as well as microscopically such as inflammation, gangrene, mummification, cystic degeneration, fatty or amyloid degeneration and calcification.

Histology. The basic substance was found to be interwoven fibrous and muscular fibrils with long rod-shaped nuclei. Numerous mast cells were scattered between these fibers. In fresh unstained sections it was possible to isolate the contractile and elastic cells by treatment with 33% potassium hydroxide. Small blood vessels were found in moderate amount, mostly with a collapsed lumen. The interfascicular connective tissue was arranged around irregular nodules of fibroid substance. (Fig. I.) These structures, characteristic of fibromyoma, were intermingled with these further elements: 1. Larger and smaller slits and caverns lined by cuboidal or cylindrical epithelium; these spaces were irregular and drawn out in the direction of one axis, the curvatures varied from convex to concave; (Fig. 2.) 2. cytogenous substances in places arranged in irregular nests or islets; (Fig. 3.) 3. glandular ductules and acini of organoid structure; 4. a fairly strong pigmented zone with pigmented cells; 5. leukocytes with fragmented nuclei. 6. tender cells of epitheloid type.

Simultaneously the specimens showed necrotic

parts, accumulated collections of polymorphonuclear leukocytes, hyperchromasy, few atypical mitoses and chromidiosis.

Fig. 1. Smooth muscle fibers of various types with interfascicular connective tissue, colliquation and slight edema of fibers.

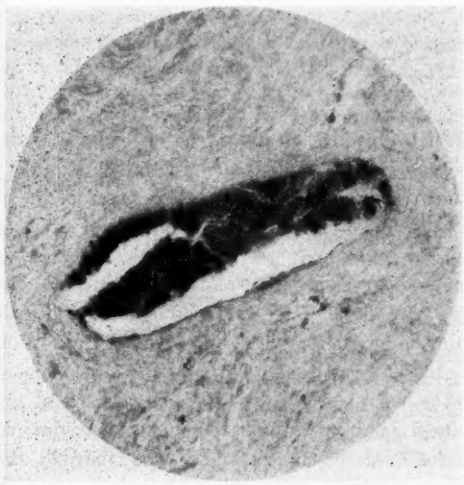

Fig. 2. Cavern lined with cylindrical epithelium, elongated in one axis, surrounded by smooth muscular tissue.

According to the above findings the diagnosis given in the four cases was heterotopic adenomyomatosis.

DISCUSSION

Concerning the histiogenesis of this type of growth von Recklinghausen wrote the first thesis on the subject. He named the tumor "adenomyoma" and grouped it histogenetically as rests of the Wolffian or Gartner's ducts. Numerous publications as to the correlation of these tumors to the rudimentary structures of the primordial kidney, epo-ophoron and paro-ophoron are testimonials for the vivid interest the histiogenetic question of these tumors aroused among the authors. The most thorough examination and description we find in L. Pick's articles; he tried

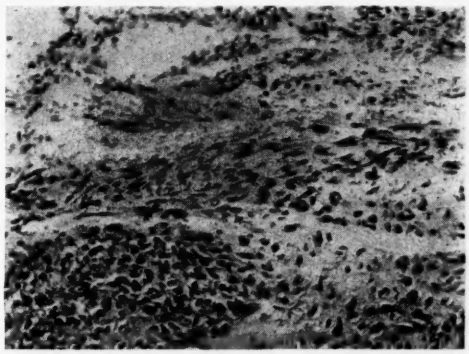

Fig. 3. Nests of cytogenous cells, chromidiosis of nuclei, cells of epitheloid type and leucocytes with fragmented nuclei; pigmentation in places.

to find the embryologic origin and rudimentary connection of the growth. The Wolffian body was given as the probable rudimentary element of the heterotopic tumors. Sitzenfrei and Pohorecky corroborated these findings, and Chevassu even described findings of a glomerulus within the independent tumor.

Yet the fact that the growth was comparatively rarely found in places or in connection with the known glandular rudiments of the primordial nephridium gave cause to doubt the congenital origin of these tumors. R. Meyer and Lubarsch brought another viewpoint into the controversy as to the classification of the heterotopic adenomyoma. According to Meyer's opinion (the one that has been predominant ever since he published his fundamental thesis on this subject), the growth is not a true blastoma. He believes the entire arrangement of the tumor to be a heterotopic epithelial proliferation due to inflammatory changes, after termination of which the etiology might be somewhat indefinite. In many cases even signs of inflammatory processes may not be found. However, the independent location of the growth, most'y in either the parametrium of the sigmoid-rectal region or ascending or descending colon, gives enough reason to believe that, by the many inflammatory processes

within or next to the larger intestinal tract and the gonads, aberrant, epithelial areas might be irritated to pathological growth. The cause of the inflammatory irritation may be unknown, yet attention may be drawn to the many serosa aberrations which are found in the abdominal cavity and there may be potential factors in formation of growths; the cellular activity influenced by the incubator temperature of the abdomen. It is reasonably presumable that in our case histories inflammatory processes in the pelvis or lower intestinal regions played a major part in the consolidation of these tumors, though the patients did not give any history pertaining to inflammation save one with the precedence of a chronic recurrent appendicitis. She had been operated on two years previously and a recurrent serofibrinous appendicitis was found. At that time the tumor was seen on top of the uterus but could not be removed on account of large appendiceal drainage. So the deduction of Meyer may be correct, that inflammatory extrinsic factors may be held responsible for the formation and later complete schisis of the probably preformed areas. Recurrence or possible metaplastic changes of these tumors into malignancies may happen, though no such statements were made in the literature. The somewhat irregular histological structure, the appearance of areas with young indefinite cells, hyperchromasis and mitoses do not allow any conclusions as to the potential sarcomatous or carcinomatous developments. However, since there are even benign metastatizing tumors found, the occurrence of metastases alone does not justify a diagnosis of malignancy.

In the described four cases the patients were fully restored after surgical removal of the growths. A few authors have recommended castration of the patients. We believe such treatment to be too radical and in our cases unwarranted.

The metabolism of these tumors is rather interesting. As mentioned before, the growths are probably favored by the higher temperature of the abdomen. The tumors thus may grow under nearly anaerobic conditions practically without any supply of oxygen from neighboring organs except for osmosis. The ordinary tumor connected to any of the vital organs absorbs a material part of oxygen and glucose from the serum as can be proven by exact measurements. In our cases the blood sugar ratio was measured in only two instances and found to be within the normal limits. Apparently without any support from the body tissues there is a regular metabolism in these heterotopic tumors, and living cells, blood vessels and secretions are found in them despite their independent existence.

Since the clinical diagnosis in none of these cases was correct before operation, studies of fermentation and reaction toward blood plasma and serum were not undertaken.

Summary. Four cases of heterotopic free adenomyomatous tumors of the abdominal cavity were described and discussed.

BIBLIOGRAPHY

1. Pick, L.: Arch. f. Gynaekol., **57**: 463, 1898-1899.
2. Sitzenfrei, A.: Zeitschrift f. Geburtsh. und Gynaekol., **64**: 538, 1909.
3. Chevassu, M.: Revue de Gynec. et Chir. abdominal, **14**: 537, 1910.
4. Pohorecky, A.: Archiv. f. Gynaekol., **60**: 252, 1900.
5. Meyer, R.: Zentralblatt f. Gynaekol., **43**: 745, 1919.

USE OF DINITROPHENOL FOR OBESITY RESULTING IN ABSOLUTE BLINDNESS AND DESTRUCTION OF BOTH GLOBES

CARROLL B. WELTON, M. D.

PEORIA, ILL.

The untoward effects on the eye following the use of dinitrophenol in the treatment of obesity usually cause the production of cataracts. In my case, together with the formation of cataract and its consequent swelling of the lenses, glaucoma supervened with panophthalmitis following, atrophy, bilateral hypotony and phthisis bulbi being the tragic result. In this condition the patient was brought to me still suffering pain in the shrunken globes, with an erythema of the skin of both upper and lower lids, considerable conjunctival discharge and fissures beyond the external canthi. The pain together with an extreme nervous state was controlled by sedatives and local treatment until she could sleep comfortably and had regained her composure. Because of its unusual features—destruction of both globes—this case is presented.

The patient, an obese woman, 46 years of age, was first seen by me February 22, 1937. Her history was as follows: In March, 1934, she was taken to a physician for a general examination because of fatigue and overweight, and he prescribed dinitrophenol for reducing her weight, which was 197½ pounds. Her height was 5 ft. 2 in. Her past and family history was nega-

tive and her complaints at this time were headaches, nervousness, a state of mental depression, debility due to her overweight and attacks of acute tonsillitis. There was no history of cataract in her family. Blood examination showed a secondary anemia and x-ray pictures showed six teeth with apical pathology. After taking the drug two weeks she caught a "head cold" and also noticed at this time that she had a profuse perspiration, becoming, as she expressed it, "dripping wet," and she also had a boil in the nose. Another physician was called and pronounced her condition "pleurisy," but she did not inform him of having taken dinitrophenol. She noticed at this time, however, a change in her vision—that print went "all together" and the letters were of "a red and green" color. She took no dinitrophenol for six weeks, at which time she underwent a tonsil operation, and later was refracted and given glasses by a local oculist. After this she again resumed the daily use of the drug, suffered severe headaches and at this time also noted that she had lost considerable weight, having reduced 20 pounds by May 24, 1934. A physician told her these headaches were caused from the menopause through which she was passing. Her vision was now markedly affected, she not being able to distinguish fine print and she also at this time had some boils on the leg. In January, 1935, she noticed changes in the distant vision, everything being "like in a fog," as she expressed it, and severe headaches, although she had continued taking the drug. At this time together with the changes in vision, she was in profuse perspiration again, weak, prostrated and faint on exertion, and the medicine was discontinued, after seeing the physician who had prescribed it. This period of time when she was taking the drug covered 11½ months. She now weighed 165 pounds, having lost 32½ pounds. She was hospitalized for 2 weeks having marked loss of vision, not being able to see newspaper print and distant vision being very dim and continually growing worse; the intense headaches continued and she had pain in the eyes and back of neck together with extreme nervousness. She was informed now by her oculist that she had cataract and he, after questioning her, ascribed it to the medicine that she had been taking for reducing her weight. She was given cabinet baths and medication, by her oculist. In May, 1935, she visited an optician who began treatments with "lights" which she continued taking until I saw her. From the time of first going to this optician the vision became progressively worse, the pain increasingly more severe both day and night and light perception was abolished shortly afterwards, that being the condition at the present time.

Although the effect of the nitrophenols in raising the metabolic rate in animals has been known for a long time Perkins'[1] investigations on munition workers in the world war brought out its many poisonous and sometimes fatal reactions. In 1933, Cutting, Mehrtens and Tainter[2] introduced dinitrophenol as a treatment in obesity. Because of the conservative dosage and stringent observation and that they encountered no susceptible individuals they enumerate only mild and transient reactions. These reactions include headache, sore throat, mild chest pains and increased respiration, backache, excessive sweating and feeling of warmth, night sweats, lassitude, nervousness, lowering of the blood pressure, vertigo, pharyngitis, otitis media,[3] abdominal pain, derangement of taste, toxic hepatitis with jaundice, maculo-papular erythema, urticaria, edema, pupura, and extreme pruritis. In the more advanced toxic cases, numbness of feet and hands, peripheral neuritis,[4] temporary mental changes, symptoms of tetany and possible myocardial dysfunction.

For the past two years after the ingestion of dinitrophenol there have been reports of the following phenomena other than the production of cataracts, by many observers—psychic disturbances, vasomotor and circulatory changes, dermatitic reactions, otologic complications, allergy,[4] cases of acute complete granulopenia with some recoveries and several deaths.[5] Seven deaths have been reported from ingestion of dinitrophenol. One death is reported from dinitrocresol[6] in Great Britain and one from nitrophenol taken for reducing by obese subjects. Leutsker[7] reports death from circulatory collapse in one case attributed to dinitrophenol. A moderate dosage is required to produce a neutropenia but Hoffman[8] and associates report a case developing after a total amount of 86 grains over a period of 14 days. In five cases the average dosage of dinitrophenol was 184 grains over a period of 58 days.

One of the cases of agranulocytic angina recovered after taking 7,600 mg. over a period of two weeks. Another of these cases taking 21,800 mg. in the form of "Nitraphen"[9] over a period of four months recovered after withdrawal of the drug and blood transfusions. In a third case 5.8 Gm. had been taken in a period of 20 days but improved after stopping the drug. A physician taking a quantity approximately 17 times the therapeutic dose died in eleven hours. Masserman and Goldsmith[10] report one death after use of dinitrophenol but with no hematologic or bone marrow changes. Goldman and Habers'[11] case of acute complete granulopenia with death was in a girl 13 years of age weighing 265 pounds who had taken 81 grains over a 46 day period with reduction in weight of 25 pounds.

In poisons taken medicinally two contributory circumstances of their ill effects are idiosyncrasy and cumulative effect of them taken over prolonged periods. Evidently dinitrophenol has a selective action on the crystalline lens by causing changes in the capsular permeability from chemical changes in the intraocular fluid. No positive tests have been shown to determine the hypersensitivity of individuals to the action of dinitrophenol.

Imerman and Imerman[12] report two cases of dinitrophenol poisoning with unusual features—anemia, thrombocytopenia purpura and lung abscess. They summarize 8 cases of granulopenia from ingestion of dinitrophenol. Prodromal symptoms occur 10 days to 4 months after the drug is started and consist of fever, sore throat and headaches. After these prodromal symptoms 1-8 days occur fever, tachycardia, increased respiration, hyperemia, ulceration, pain and swelling of gums, pharynx and soft palate. They conclude, in view of the rapidly increasing number of untoward effects of this drug such as peripheral neuritis, cataracts, anemia, thrombocytopenia, and purpura as well as the report of the Council on Pharmacy and chemistry[13] for not accepting this drug in New and Non-official Remedies (July 1935) that physicians should make every effort to discourage its use. "The Council warned the profession when it was first brought out, against the use of the drug on an extensive scale until adequate clinical evidence was available to show its harmlessness. Again in 1935 it issued reports of warning and refused to include the drug in New and Non-Official Remedies. This conservative stand proved valuable when experience with the drug showed it to be potent for irreparable harm in certain instances."

Dinitrophenol produces, according to David and Frances Cogan,[14] "the development of cataract unlike other toxic reactions and arise from therapeutic dosage."* Neither they nor Whalman,[15] who has analyzed 40 cases found in the literature, can determine that the eye changes are dependent upon amount or length of time the drug is taken nor how soon the changes take place after ingestion of the drug but are agreed that once the pathological processes in the lens begin they are rapid in their development. One patient's vision in one week fell from observable dimness to light perception. The toxic effect of dinitrophenol, they show, may occur after the drug has been discontinued altogether. Four patients in their series developed cataract a year after the discontinuance of the drug while two more developed them three months after discontinuation. Cogan calls attention to the polychromatic opacities in the anterior part of the lens and this may account for the visual color changes as complained of by my patient. In Whalman's series of 40 cases, acute glaucoma developed in two cases, one in six weeks and the other in 30 days. Kniskern reports two cases and Lewin[16] reports one case of increased tension in patients after taking dinitrophenol.*

Shutes[26] reported 3 cases of dinitrophenol cataracts, one of these a woman who having failing vision in October, 1934, together with one of Kniskern's patients were the first in whom changes in vision occurred from dinitrophenol.

Hitch and Schwartz[17] up to June, 1936, have found 14 reports of bilateral cataracts and also noted in their case that cataracts developed from an extremely small amount of the drug and the lenticular changes remained as minimal opacities throughout observation. They believe the slight visual impairment would have escaped the patient's notice had she not been under hospital observation and suggest the possibility that other persons with similar degrees of impairment have not sought medical aid.

Rundles[18] records a case of cataract following the use of dinitrophenol for reduction of weight. Hill[19] reports a 36-year-old woman in whom cataract formed one year after dinitrophenol was discontinued and from the first onset of symptoms blindness was complete in 8 weeks.

Brobeck,[20] Shields,[21] Lasar,[22] Gifford,[23] (reported by Lasar), Kniskern,[24] Allen and Benson,[25] Boardman,[27] Glowacki,[28] Lewin,[16] report single cases of cataract after dinitrophenol ingestion. Hessing[29] reports some cases and Lukens,[30] three cases from the same cause. Lasar theorizes that the tremendous dehydration of tissue may hasten maturity of lens opacities already present. Frost,[33] reports partial optic atrophy in a patient from skin absorption of dinitrophenol.

In one of Veasey's[34] cases vision began to fail

*Schulte[48] found no lenticular opacities in dogs when fed dinitrophenol nor any demonstrable liver impairment.

*Tension rose in 4 instances in Horner's cases and required immediate surgical intervention.

10 months after the last dose had been administered and within 6 weeks from the first symptom of failure the vision was practically abolished. In another of his cases there was a period of 9 months before the vision began to blur and within 6 weeks there was a mature cataract. In Cogan's[14] cases the average daily dose of all the patients was .45 gram. Three of these patients took only a daily dose of .3 gram. The average period dinitrophenol was taken in 16 cases was about 8 months. Of 20 cases of Cogan's only 3 patients had any other toxic manifestations—one having had slight gastro-intestinal symptoms, another complained of numbness of her feet and hands, and a third had peripheral neuritis.

Spaeth[35] in his case believes dinitrophenol produced a parathyroid deficiency as the latter condition is a known cause in the production of cataract. His patient took 1,300 grains. Mental changes (apathy and instability) were noted. Clinical and laboratory signs of tetany appeared after the mental symptoms. In this connection Russo[36] reports that twelve days following a thyroid operation a woman had severe recurring convulsions at intervals. Six months later cataract developed and the author believes tetany and cataract are expressions of the same pathogenic factor—caused by disturbance of electrolytic equilibrium especially of the calcium. The lens opacity is attributed to changes in the capsular permeability arising from chemical disintegration of the intraocular fluid.

Kugelberg[37] examined the lenses of 142 patients between 4 and 18 years of age who had been treated for tetany and a control of 101 normal children between 7 and 14 years of age. Of the 142 with a history of tetany 30% had zonular lenticular opacities. None of the controls showed cataract. These findings confirm the view that tetany caused by infantile parathyroid deficiency is the etiological factor in zonular cataract. Of the pathologic series 57% had enamel hypoplasin of the teeth and 35% of these had cataracts.

Horner[46] of San Francisco does not believe that there are over a hundred cases, in which cataract has followed the administration of *dinitrophenol. He, however, states that he has* seen four new cases in February, 1936, making a total of eleven cases observed by him, and it is probable that more of the drug was prescribed or used in California than in any other locality in the United States. He believes that cataracts occur in from one-tenth to 1% of cases, and he thinks the drug should be withheld pending further study. In August, 1936, Van der Hoeve and Daniels[42] published a warning abroad against the dangers of dinitrophenol. The authors observed a case of binocular cataract formation resulting from absorption of 40 gm. of dinitrophenol. The drug was given in two periods and at no time had the daily dosage been exceeded. About 6 months later the initial symptoms were noted. Marcove[43] reports a case of dinitrophenol cataract in which the changes in the lens were followed from its inception and began in the anterior and posterior subcapsular areas then with rapid involvement of older cortical fibers and cortex.

Rodin[44] reviews 32 cases of dinitrophenol cataract. The length of time the drug was taken was from 3 months to 2 years. In 27 patients cataracts appeared within 15 months. He believes from analysis of these cases that the length of time the drug is taken is not a factor in the production of the lens opacities.

Since in obesity, Short and Johnson[45] have found there is an increased total metabolism, the giving of metabolic stimulants in form of either thyroid preparations or of drugs such as dinitrophenol is entirely illogical. Medical treatment for cataract is useless but good results may be obtained by operation according to Horner,[46] who, in 14 extractions obtained vision of 0.8 or better. These findings of good surgical risk are corroborated by Barkan[47] and his associates who report results of operation in 24 cases and conclude that the prognosis for useful vision is good.

Inquiries of different retail pharmacists in this city, elicit the information that the druggists still carry for sale dinitrophenol even in the form of one grain and a half tablets.

Dinitrophenol has been sold under the name of "Dilex-Redusols" but against this preparation was issued a fraud order by the Post Office department. Another reducing medicine is sold under the name of "Slim" which contains dinitrophenol and which has been the cause of some of the complications following the use of dini*trophenol. Other preparations, among them,* "Nox-Ben-ol", "Slendrets" and "Reducoids" are on the market at the present time and across the *cap of the bottle of the latter is a seal which* states that there is no "Dinitrophenol" used in

this preparation. An investigation should be made to see if the latter statement is correct in this or other preparations sold at the present time. In the 1936 edition of Beren's Text-Book on the eye, I could find no mention of the poisonous effects of dinitrophenol.

CONCLUSIONS

1. The danger of susceptibility of an individual to dinitrophenol and its selective action upon the crystalline lens of the eye together with its lethal effects on other organs of the body prohibits its use by physicians. There is no known specific chemical antidote for dinitrophenol poisoning and no positive tests have been shown to determine hypersensitivity of an individual to its action.

2. Dinitrophenol is still offered for sale by drug stores. The drug is perhaps still advertised in newspapers and over the radio. Sale of such a dangerous medicament should be prohibited by law. There are now enough reports in the literature of its disastrous effects, of deaths, blindness and other serious pathologic bodily changes in susceptible patients to condemn its use altogether.

3. Any patient who has been subject to the possible disastrous effects on the eyes of dinitrophenol should be carefully watched for the first changes in the lens, the amount of swelling and the possible advent of increased tension and progressive involvement of the various structures of the eye. Glaucoma, positively occurring in this case, has been reported in several cases following use of the drug and unless proper measures are taken medically and surgically where increased tension appears, disaster is inevitable.

4. My patient, had she sought medical aid at the time the lenses became intumescent and continued under close medical supervision would not have had the extreme involvement of the whole contents of the eyes resulting in panophthalmitis, atrophy of the globes and complete loss of vision.

REFERENCES

1. Perkins, R. G.: Pub. Health Rep. 34: 2335, 1919.

2. Cutting, W. C., Mehrtens, H. G., and Tainter, M. L.: "Actions and Uses of Dinitrophenol," J. A. M. A., 101: 193, 1933.

3. Dintenfass, Henry: "An Ear Complication from Dinitropenol Medication," J. A. M. A., 102: 838, 1934.

4. Anderson, H. H. L., Reed, A. C. and Emerson, G A.: "Toxicity of Alpha-Dinitrophenol," J. A. M. A., 101: 1053, 1933.

5. Geiger, J. C.: "A death from Alpha-Dinitrophenol Poisoning," correspondence, J. A. M. A., 101: 1333, 1933.

6. "Accidents after Medicinal Use." London Letter, J. A. M. A., 106: 1745, 1936.

7. Leutsker, R. J.: "Instance of Circulatory Collapse attributed to Dinitrophenol," U. S. Nav. M. Bull., 33: 394, 1935.

8. Hoffman, A. M., Butt, E. M. and Hickey, N. G.: "Neutropenia Following Aminopyrine," J. A. M. A., 1021: 1213, 1934.

9. Goldman, Alexander and Haber, Mordecai: "Acute complete granulopenia with death due to Dinitrophenol poisoning," J. A. M. A., 107: 2115, 1936.

10. Masserman, J. H. and Goldsmith, Harry: "Dinitrophenol," J. A. M. A., 102: 523, 1934.

11. Ibid. J. A. M. A.

12. Imerman, S. W. and Imerman, C. P.: "Dinitrophenol Poisoning," J. A. M. A., 106: 1085, 1936.

13. J. A. M. A. Council on Pharmacy Report: 106: 1172, 1936.

14. Cogan, D. G. and Cogan, F. C.: "Dinitrophenol Cataract." J. A. M. A., 105: 793, 1935.

15. Whalman, H. F.: "Dinitrophenol Cataract." Amer. J. Opth., 19: 885, 1936.

16. Lewin, Thurbar: Discussion, Proc. Sec. of Ophth. A. M. A. 1936.

17. Hitch, J. M. and Schwartz, W. F.: "Late Toxic Results, Including Dermatitis Exfoliativa from 'Slim' (Dinitrophenol)." J. A. M. A. V., 106: 2130, 1936.

18. Rundles, W.: "Dinitrophenol Cataract." J. Michigan State Med. Soc., 34: 777, 1935.

19. Hill, H.: Indiana State Med. Assn., 29: 67, 1936.

20. Brobeck, V. H.: Proc. Colorado Ophth. Soc., "Cataracts following the use of Dinitrophenol." Amer. J. Ophth. 19: 398, 1936.

21. Shields, J. M.: Discussion. Colo. Ophth. Soc., 19: 897, 1936.

22. Lazar, N. K.: "Cataract Following the Use of Dinitrophenol." J. A. M. A., 195: 794, 1935.

23. Ibid.

24. Kniskern, P. W.: "Cataracts Following Dinitrophenol." J. A. M. A., 105: 794, 1935.

25. Allen, T. D. and Benson, V. M.: "Late Development of Cataract Following Use of Dinitrophenol About One Year Before." J. A. M. A., 105: 795, 1935.

26. Shutes, M. H.: "Dinitrophenol." Amer. J. Ophth., 18: 752, 1935.

27. Boardman, W. W.: "Rapidly Developing Cataract After Dinitrophenol." J. A. M. A., 105: 108, 1935.

28. Glowacki, B. F.: "Acute Cataracts Presumbaly Due to Dinitrophenol Therapy." J. Michigan M. Soc., 34: 535, 1935.

29. Hessing, E. E.: Report of Cases. "Cataract Due to Dinitrophenol." Arch. Ophth., 17: 513, 1937.

30. Lukens, Charles: Discussion Proc. Sec. of Ophth. A. M. A. 1936, p. 189.

33. Frost, Albert D.: Discussion Proc. Sec. on Ophthal. Amer. Med. Assn. 1936, p. 187.

34. Veasey, Clarence A.: "Report of two cases of cataract following the use of Dinitrophenol." Amer. J. Ophth., 19: 332, 1936.

35. Spaeth, Edmund B.: "Dinitrophenol Cataracts with Signs of Tetany." Amer. J. of Ophth., 19: 320, 1936.

36. Russo, A. Boll d'Ocul. "Tetany and Bilateral Cataract after hemi-thyroidectomy in a young woman affected by Basedow's disease." 15: 890, 1936.

37. Kugelberg, I.: "Tetany and Cataract." Acta Ophth., 14: 220, 1936.

41. Nadler, J. Ernest: "Peripheral Neuritis caused by prolonged use of Dinitrophenol." J. A. M. A., 105: 12, 1935.

42. Van der Hoeve and Denials: Nederl. tydschr. v geneesk., 80: 3822, 1936.

43. Marcove, M. E.: "Dinitrophenol Cataract." Colorado Ophthal. Society. Amer. J. Oph., 19: 899, 1936.

44. Rodin, F. H.: Cataracts following the use of "Dinitrophenol." California and West. Med., 44: 276, 1936.

45. Short, J. M. and Johnson, H. J.: "Increased Metabolism of Obesity." J. A. M. A., 106: 1776, 1936.

46. Horner, W. D.: "Cataract following Dinitrophenol treatment for obesity." Arch. Ophth., 16: 47, 1936.
47. Barkan, H. Borley, W. Fine, M. and J Bettman: "Operative Results in Cataracts Coincident with Dinitrophenol Therapy." California and West. Med., 44: 360, 1936.
48. Schulte, T. L.: "Chronic Toxicity of Dinitrophenol; Functional and Morphologic Changes in the Liver." J. of Pharm. & Exp. Therap., 59: 419, 1937.

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DIARRHEA—GASTRO-COLIC FISTULA

Report of Seven Cases Based on 7,000 Proctoscopic Examinations

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In a brief resume one hesitates dwelling too much on detail and on "rehashing." My objective in this paper is to emphasize one important essential in dealing with diarrheas and to illustrate this by a clinical case. I want to again stress the importance of determining the cause of a diarrhea before attempting treatment. For obvious reasons the line of least resistance seems to sway the opinion of both the physician and the patient, and commonly the method of approach is symptomatic treatment. When a diarrhea persists a week or two, certainly a careful investigation is indicated and should be urged by the physician.

I made a careful summation of all diarrheas observed in the past eleven years and can truthfully say that about 50% of all diarrheas observed were of four months duration or longer and had not at any time had a careful proctoscopic examination. I will outline the various groups as follows:

A. It is clear that in ulcerative lesions of the colon, persistent diarrhea is not an early symptom, but it is, however, worthy of note that a large percentage of ulcerative lesions of the colon present a history of change of bowel habit, first as to frequency of stools, and secondly as to their consistency. The change in bowel habit I believe is probably the earliest subjective symptom. If the patient presents himself at that period, a careful proctoscopic examination may reveal early pathologic changes, such as marked inflammatory changes or edema of the colon, and thus will enable the physician to treat these cases at an early stage of the disease and will safeguard prolonged disability to the patient.

B. Patients who have diarrhea and do not improve on symptomatic management outlined for several weeks should have a careful proctoscopic examination, because very often the origin of diarrhea is gastrogenic and a proctoscopic examination is the only means of approach to aid in the differential diagnosis.

C. Another form of diarrhea commonly observed in this series is a type which occurs at certain indefinite intervals. This form of diarrhea does not elicit blood in the stool and the patient does not ordinarily lose weight. In this group, a proctoscopic examination is essential in that it may definitely demonstrate a normal mucosa and normal activity of the colon and rectum per se. All diarrheas of this group may be classed under a group of diarrheas of reflex origin, especially from pathologic sources of the lower abdomen and pelvis in the female.

D. In diarrheas which may have been produced because of postoperative adhesions, causing retention of toxic products, it is necessary to rule out the colon itself, because pathology of the colon mucosa may be superimposed upon the toxic and the mechanical cause.

E. It is most important, of course, to realize the part which the rectum may play in prolonging the diarrhea. A marked proctitis, which is so readily produced by a persistent diarrhea, may continue to be the etiologic factor of diarrhea despite the fact that the colon per se may have been cleared of pathology or not involved at all at the onset.

All I have mentioned is merely to indicate causative factors of diarrhea and to emphasize how they may apply and how essential it is to differentiate a pathological from a normal colon by proctoscopic examination. There is one group of diarrheas which I would like to refer to by an illustrative case:

A man, aged 27, presented himself to a physician with a clinical history of duodenal ulcer. He had been on management, and later in the judgment of the physician the patient was advised to have a gastroenterostomy. He made an uneventful recovery and carried on a useful life for about two years. At this time the patient returned complaining of a sudden onset of diarrhea varying from 6 to 10 stools daily. No blood or pus or mucus was evident in the stool and no pain or cramping was noted at any time.

Symptomatic treatment was applied, but the diarrhea persisted and the patient grew progressively worse, continued to lose weight and became markedly dehydrated. Stools examined for parasites were negative. Gastrointestinal series proved negative. About one and a half years later I was called to see the patient and I suggested a proctoscopic examination.

Proctoscopy revealed a markedly inflamed colon uniformly red, demonstrated no ulcerations and no evidence of any organic disease. *In differentiating the* colon on an inflammatory or organic basis, I felt fairly certain that the diarrhea was undoubtedly of gastrogenic origin, and proceeded with roentgenology.

Barium Enema revealed the barium sulphate traversing the descending colon proximally, entering the stomach and passing into the small intestine from a second aperture out of the stomach. The diagnosis was made of a *gastrocolic fistula* and exploration performed.

Discussion. Gastrocolic fistulas were first discovered by Murchison in 1857. Since then cases were reported by Pratt (1923), Bec (1897), Port and Reizenstein (1907), Voorhaere (1912), Rankin (1921), Czerny (1903), Bolton and Trotter (1920), and Judd (1921).

I have had the opportunity to diagnose and treat seven gastrocolic fistulas in ten years. The majority of such fistulas are caused by malignant lesions in the greater curvature of the stomach, and secondly, these fistulas are due to gastrojejunal ulcers following gastroenterostomy.

The interesting phase of this entity is that the gastrocolic fistula does not produce any symptoms until the new stoma between the two viscera is complete. A severe bleeding spell occasionally marks the onset of the perforation of the stoma. One of the most characteristic features of the gastrocolic fistula is *diarrhea* lienteric in type and evidenced almost instantly upon food intake. At occasional intervals the false passage becomes closed and the patient is symptom free, but the freedom is only intermittent.

While I do feel that a proctoscopic examination is most helpful in observing the pathology of the mucosa of the colon, it is very essential to complete the diagnosis by the aid of roentgenology. The reason why roentgen examination made by oral administration does not always reveal the suspected case is because the redundant mucosa often covers the fistula from above downward and acts like a ball-valve; more often where the barium meal fails, the barium enema succeeds in revealing the true nature of existing pathology.

As to treatment, one has very little to promise medically; the condition requires surgical measures. The surgical mortality is very high, but does not approach the high rate of mortality if operation is not performed.

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MORTALITY REPORT OF THE DEPARTMENT OF OBSTETRICS AND GYNECOLOGY OF THE UNIVERSITY OF CHICAGO CLINICS AND OF THE CHICAGO LYING-IN HOSPITAL

May 25, 1931 to June 30, 1936

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A summary of statistical data relating to the procedures performed at a single institution is of greatest value to the personnel of that institution. Such a summary is of general value in furnishing a record of results extending over a period of years. When combined with similar statistics collected elsewhere it may emphasize weak points in the practices of the past and thus serve to establish trends in future medical practice. The following tables present the results of such a study at The University of Chicago clinics and The Chicago Lying-in Hospital and Dispensary. They are presented in part to correct false impressions which may have resulted from inaccurate statements appearing in the lay press during May and June, 1936. The data presented here includes only those cases cared for in the new institution.

Obstetrics. The new physical plant of The Chicago Lying-in Hospital was opened on May 25, 1931, in affiliation with The University of Chicago. From that time until June 30, 1936, a total of 16,769 obstetric patients were treated (see Table 1). In this group there were 41 deaths. This gives a total gross mortality of 0.244% (24.4 per 10,000). There were 13,735 hospital deliveries and 2,461 deliveries in the home. The Home Service division was not established until October, 1932. Of the entire group 55.8% were multiparae (Table 2). Fetal position is also recorded in Table 2.

It will be seen from Table 3 that 11,020 (67%) of the deliveries were natural. There was therefore an operative incidence of 33% (5,337) in the total series. This increases to 37.5% (5,204) among the hospital deliveries. More than one-half of the operative procedures were low forceps deliveries. The number of deaths is divided equally between the natural and operative deliveries.

Table 4 lists a miscellaneous group of operative procedures upon obstetric patients. It in-

cludes all of the additional hospitalized patients and in some instances, notably the breast abscess group, duplicate cases previously reviewed. The three deaths in this series are further summarized in later tables.

In Tables 5 and 6, the cases with a fatal result are reviewed. In total there were 48 deaths among obstetric patients. For seven of these we cannot assume responsibility as they were admitted to the hospital following delivery by other agencies (Table 6). Four died of sepsis, one of pneumonia and two of meningitis (one tuberculous and the other following a pneumonia). Of the remaining 41 patients, seven died undelivered. Two of these died of pelvic infection—one at 18 weeks gestation and the other at term. In both, death occurred before the onset of labor. Two were eclamptics in whom the disease was fulminating. One, who died of cardiac failure, was 10 weeks pregnant. One had been successfully treated for hyperemesis and died at 24 weeks of a pulmonary hemorrhage of unknown etiology. The other was approximately 20 weeks pregnant and died in an unforeseen diabetic coma.

The third group consists of those delivered by the Chicago Lying-in Hospital staff. Death was from a variety of causes. The most frequent was infection which in four cases followed natural delivery, in one case came after a midforceps operation and in the other instance was subsequent to laparotrachelotomy and sterilization of a cardiac patient.

The second largest group consisted of deaths from hemorrhage. One was a natural delivery in the home, one followed craniotomy for a post mature child, and one was in a patient with preeclamptic toxemia who delivered naturally and bled because of a retained placental cotyledon. The fourth was an eclamptic who delivered naturally.

Three patients died of hemorrhage associated with uterine rupture. In one instance a Braxton Hicks' version had been done on a five to six months' fetus. There was an associated premature detachment of the placenta. In the second a version and extraction had been performed and in the third, delivery of a dead fetus was accomplished by Dührssen's incisions and craniotomy. One patient died of hemorrhage from omental vessels the day following a laparotrachelotomy in which extensive adhesions had been encountered.

There were five deaths from cardiac disease. Two of these delivered naturally and two were delivered by low forceps application and extraction. The other had a laparotrachelotomy.

Three deaths were due to pneumonia. In one of these the patient had a severe cold before delivery. In the second its origin was due to aspiration. The source of infection in the third case was unknown.

There were three cases of pulmonary embolism or pulmonary collapse. One of these occurred in a spontaneous abortion at 14 weeks in a patient with an acute nephritis. One occurred two and one-half hours after a spontaneous delivery in the home and the third occurred on the eighth day following a low forceps delivery.

The two patients with severe meningitis were delivered by cesarean section and in both instances the operation was performed solely in the interests of the baby. The infection was tuberculous in both cases.

The patient with hyperthyroidism had refused a hospital delivery and died from cardiac failure and pulmonary edema one day following a natural delivery.

The patient with gonorrheal endocarditis died 26 days following natural delivery. She also had a gonorrheal arthritis.

The death attributed to hyperemesis gravidarum had the pregnancy terminated at 12 weeks by vaginal hysterotomy. The eclamptic patient was delivered of a premature dead fetus by craniotomy.

In the patients who died of diphtheria and agranulocytic angina the cause of death is self explanatory. The remaining death occurred from infection in a patient operated on for the removal of an ectopic gestation.

The 34 deaths which followed delivery and termination of pregnancy may also be considered from the standpoint of the associated procedure. (Table 5). In 15 cases death was subsequent to natural delivery. In four instances in this group death was due to infection. One of these patients was delivered of a stillborn infant in the home following one and one-half hours of labor complicated by a partial early separation of the placenta. The other three had natural deliveries with episiotomy in the hospital.

Three patients who delivered naturally died from postpartum hemorrhage. One of these was complicated by a preeclamptic toxemia and

retention of a placental cotyledon. One was an eclamptic. The third occurred following delivery in the home.

Two patients in this group had cardiac decompensation and died of cardiac failure subsequent to delivery. Two patients developed pneumonia following natural delivery. In the remaining four cases death was due in one instance each to pulmonary embolism, gonorrheal endocarditis, diphtheria and hyperthyroidism with cardiac failure.

There were five deaths among the low forceps deliveries. Two of these were cardiac patients. One each died of pulmonary embolism, pneumonia and agranulocytic angina.

One patient delivered following mid-forceps application died of puerperal infection. She was admitted to the hospital where delivery was accomplished, after she had been in labor in the home under observation by the Home Service division.

One death occurred following version and extraction in a brow presentation and was due to hemorrhage from a ruptured uterus. One death followed Braxton Hicks' version in which uterine rupture also occurred.

Three patients died subsequent to delivery by craniotomy. One of these died of postpartum hemorrhage. In one case death was due to eclampsia. In the third instance death was due to hemorrhage from a uterine rupture.

Five deaths occurred among the patients delivered by cesarean section. In two cases the classical operation was performed in patients with tuberculous meningitis in successful attempts to save the baby. In one case laparotrachelotomy and tubal ligation was done because of a vesicovaginal fistula. Extensive dissection was necessary during the operation because of adhesions encountered. This patient died of postoperative hemorrhage from omental vessels. One patient died of cardiac failure following laparotrachelotomy because of the heart disease. The other patient was delivered by laparotrachelotomy and was sterilized because of cardiac disease. She died of sepsis 67 days postoperative.

One patient died following vaginal hysterotomy performed to interrupt a 12 weeks' pregnancy complicated by hyperemesis. Death was due to the hyperemesis. One patient with an acute nephritis died following unintentional abortion at 14 weeks of pulmonary embolism. One patient died from infection following laparotomy for removal of an ectopic gestation.

Tables 7 and 8 present a summary of obstetric results from the standpoint of the fetus. In Table 7 the separation between previable and premature infants is incomplete as we did not standardize our groups until 1932. It is to be noted that there were 16,003 live births in the total series with 354 stillbirths. There were 300 neonatal deaths. This gives a gross fetal mortality of 654 or 3.9%. When the 59 previable infants under 1,000 grams in weight are deducted the gross mortality becomes 3.6%. These groups are further subdivided in the tables.

Gynecology. The division of gynecology began operating in the Billings Hospital at The University of Chicago in October, 1929. This summary of gynecologic operations begins with that date and from May 25, 1931 includes both the operations performed there and in the new Chicago Lying-in Hospital.

During this period 3,202 gynecologic operations were performed with a mortality of 26 or 0.81%. In addition 15 deaths occurred in non-operative patients. Of this later group 12 were due to genital malignancies, two to infection and one to cardiac disease.

Table 9 lists those operations which were considered as of minor risk to the life of the patient. In general they did not involve opening of the peritoneal cavity and were largely perineal and vaginal procedures. Those listed as vulvovaginal procedures include a miscellaneous group, such as removal of condylomata, urethral caruncles and stem pessaries, excision of Bartholin and vaginal cysts and incision of Bartholin, perineal, perianal and urethral abscesses. The colpotomies include both anterior and posterior approaches and were in most cases done for the drainage of pelvic abscesses.

The group listed under trachelorrhaphy, perineorrhaphy and anterior colporrhaphy were often combined procedures. The number recorded is that of the individuals operated upon and most of them had two or more of the procedures listed. There was one death in this series. This patient had a dilatation and curettage, anterior colporrhaphy and perineorrhaphy. She died on the eighth postoperative day of pelvic thrombophlebitis, septicemia, lung abscess and bilateral empyema.

In the 18 patients with fistulae both recto-

vaginal and vescicovaginal fistulae are included. The patient who died was operated on for a vesicovaginal fistula and died 31 days postoperative with a cystitis, pyelitis and nephritis.

The remainder of the table is self-explanatory with perhaps the exception of the group listed as secondary closure of the abdominal wound. The majority of these were closures following superficial separation associated with wound infection. Death occurred in two of the patients in which evisceration developed. These deaths are charged to the original operation which was a complete hysterectomy with adnexal removal in one case and a bilateral adnexal removal in the other.

In Table 10 are grouped the major gynecologic procedures. There were 24 deaths in 1,323 cases in this group which is 1.81%. Death was attributed to cardiac disease in nine cases, to infection in eight cases, to pulmonary embolism in four cases and to pulmonary edema, anuria, and carcinoma in one case each.

In the first group vaginal hysterectomy was done in addition to colpocleisis in nine cases. There were two deaths. One of these was due to cardiac disease and the other to pulmonary embolism.

The second group consisted of 51 vaginal operations primarily for the repair of relaxation in the course of which the peritoneum was opened. In most cases this was done in order to expose the appendages so that sterilization might be done. There were no deaths.

In the third group are listed 150 vaginal hysterectomies with three deaths. Most of these were performed for the cure of prolapsus uteri but a few were performed in the treatment of small fibroids or because of irregular uterine bleeding of non-malignant origin. One of the deaths was due to pulmonary embolism. The other two were due to infection plus intestinal obstruction.

There were 511 patients upon whom incomplete hysterectomy was performed. The most frequent indication for operation was the presence of benign uterine neoplasms. Approximately one-half of the operations were for this reason. Next in frequency was adnexal disease forming approximately one-fourth of the group. In about one-third of the cases the uterus alone was removed, in one-third both adnexae were removed and in the remaining third one tube and ovary were removed. There was one death in each of these three divisions so that removal of the adnexae did not appear to increase the risk. Death was due to peritonitis in two cases and to pulmonary and cerebral embolism in the other case.

There were 175 complete abdominal hysterectomies. Here again benign uterine neoplasms were the indication for operation in approximately one-half of the cases. Benign ovarian neoplasms and adnexal disease formed nearly one-third of the indications. Irregular and profuse uterine bleeding was the indication in one-half the remainder. Malignant disease of the uterus was the fourth largest group.

Both adnexae were removed in nearly one-half the cases and six of the seven deaths occurred here. In the remaining half the division is nearly equal between those in which the uterus was removed alone and in which one adnexa was removed. The seven deaths were due to infection, cardiac disease and pulmonary embolism in two cases each and to urinary suppression of unknown etiology in one case.

The 42 patients who had combined vaginal and abdominal operations consisted of patients requiring vaginal plastics and less extensive forms of intrapelvic surgery. Most of these were suspensions of the uterus, removal of diseased adnexae or of the appendix. In a few cases hysterectomy was performed. There were no deaths in this group.

Myomectomies were performed in 27 cases without mortality.

In the group listed as operations upon the ligaments, tubes, ovaries and appendix there were 244 cases with four deaths. These patients in most cases had more than one procedure performed. Appendectomy was not the primary operation in these cases, but was performed following the gynecologic procedure when inspection indicated and the patient's condition warranted it. Death was cardiac in origin in three of the fatal cases in all of which ovarian cysts had been removed. In the fourth case it was due to infection following separation of extensive adhesions and removal of both tubes and ovaries.

The group of exploratory laparotomies consisted in nearly all cases of patients in whom a preoperative diagnosis of ovarian malignancy had been made and the abdomen opened to obtain tissue for microscopic examination. When more extensive procedures were done the cases were

transferred to the appropriate group. Four of these patients died. In two instances death was cardiac. In one case with extensive abdominal carcinomatosis death occurred fifteen days postoperatively and is listed as due to the carcinoma. In the other case peritonitis was the cause of death.

The last group is of three cases upon whom radical vulvectomy and inguinal gland resection were performed for carcinoma of the vulva. There was no operative mortality, one patient having died eleven months later of recurrence of the carcinoma.

Particular information on various aspects of this study may be obtained from the following list of special studies which have previously been published.

BIBLIOGRAPHY

Adair, F. L., Hunt, A. B., and Arnell, R. E.: Vascular Collapse in Toxemia of Pregnancy. J.A.M.A., 107:1036, 1936.

Adair, F. L., and DaSef, L.: The LeFort Colpocleisis. Am. J. Obst. & Gynec., 32:218, 1936.

Adair, F. L., and DaSef, L.: LeFort Operation for Uterine Prolapse. Am. J. Surg., 33:459, 1936.

Daily, E. F.: Cesarean Section. Am. J. Obst. & Gynec., 30:204, 1935.

Daily, E. F.: Placenta Previa. Surg., Gynec. & Obst., 59:106, 1934.

Dieckmann, W. J.: The Toxemias of Pregnancy. Surg., Gynec. & Obst., 59:678, 1934.

Hunt, A. B., and McGee, W. B.: Dührssen's Incisions. Am. J. Obst. & Gynec., 31:598, 1936.

Swanson, W. W., Turner, A. R., and Adair, F. L.: Institutional Mortality of the New Born. J. Ped., 7:516, 1935.

Swanson, W. W., Lennarson, V. E., and Adair, F. L.: The Premature Infant. J. Ped., 9:11, 1936.

TABLE 1. OBSTETRICS
SUMMARY OF PATIENTS
May 25, 1931—*June* 30, 1936

	Total	Deaths
Deliveries (Natural and Operative)	16,196	31
Operative Procedures (Not Delivery)	566	3
Undelivered	7	7
Total	16,769	41

Gross Total Mortality—0.244 per cent.

TABLE 2. OBSTETRICS
PARITY AND FETAL POSITION

	Hospital	Home Service	Total	Per Cent
Primiparae	6593	507	7100	43.8
Multiparae	7125	1926	9051	55.8
Unrecorded	17	28	45	0.4
Total	13,735	2461	16,196	100.0
Vertex	12,622	2245	14,867	90.9
Breech	592	65	657	4.0
Other	75	6	81	.5
Unrecorded	581	171	752	4.6
Total	13870	2487	16,357	100.0

TABLE 3. OBSTETRICS
METHODS OF DELIVERY OF BABY
May 25, 1931—*June* 30, 1936

	Hospital	Home Service	Total	Deaths
Natural	8666	2354	11,020	15
Low Forceps	2986	45	3,031	5
Mid Forceps	651	28	679	1
Breech Extraction	519	52	571	0
Version and Extraction	118	7	125	2
Cesarean Section	853	0	853	5
Miscellaneous	77	1	78	3
Total	13,870	2487	16,357	31

Note: 71 Cervical Incisions (Dührssen) were performed in combination with the above.

TABLE 4. OBSTETRICS
OTHER OBSTETRICAL PROCEDURES
May 25, 1931—*June* 30, 1936

	Total	Deaths
Unintentional Abortion	98	1
Therapeutic Abortion (D. & C.)	35	..
Incomplete Abortion (D. & C.)	188	..
Laparo-Hysterotomy with or without Sterilization	60	..
Vaginal Hysterotomy with or without Sterilization	5	1
Hysterectomy for Ruptured Uterus	5	..
Laparotomy for Ectopic Gestation	21	1
Removal of Moles	5	..
Drainage Breast Abscess	149	..
Total	566	3

TABLE 5. OBSTETRICS
PROCEDURES ASSOCIATED WITH MORTALITY*
May 25, 1931—*June* 30, 1936

Natural Delivery	15
Low Forceps Delivery	5
Mid Forceps Delivery	1
Version and Extraction	1
Braxton Hicks' Version	1
Cesarean Section	5
Craniotomy	3
Vaginal Hysterotomy	1
Unintentional Abortion	1
Ectopic Pregnancy—Laparotomy	1
Undelivered	7
Total	41

*Excludes cases delivered under other auspices and admitted postpartum.

TABLE 6. OBSTETRICS
CAUSE OF OBSTETRICAL DEATHS
May 25, 1931—*June* 30, 1936

	Delivery by Chicago Lying-in	Undelivered	Delivery Elsewhere	Total
Infection				
Antepartum	..	2*	..	2
Postpartum	6	..	4	10
Hemorrhage				
Postpartum	4	..	..	4
Ruptured Uterus	3*	..	..	3
Postoperative	1	..	..	1
Eclampsia	1	2	..	3
Hyperemesis	1*	..	..	1
Cardiac Disease	5	1*	..	6
Pulmonary Embolism	3*	..	..	3
Pneumonia	3	..	1	4
Meningitis	2	..	2	4
Pulmonary Hemorrhage	..	1*	..	1
Endocarditis—Gonorrheal	1	..	..	1
Diphtheria	1	..	..	1
Diabetes	..	1*	..	1
Hyperthyroidism	1	..	..	1
*Agranulocytic Angina	1	..	..	1
Infected Ectopic Gestation.	1*	..	..	1
Total	34	7	7	48

*One in each of these groups was a pregnancy before viability.

TABLE 7. OBSTETRICS

DEVELOPMENT AND CONDITION OF INFANTS

May 25, 1931—*June* 30, 1936

Infants Delivered	Hospital	Home Service	Total
Previable (Incomplete)	49	14	63
Premature	763	79	842
Term	12,989	2382	15,371
Unrecorded	69	12	81
Total	13,870	2487	16,357
Multiple Births	134 (1 triplets)	26	161
Patients Delivered	13,735	2461	16,196
Live Births	13,553	2450	16,003
Stillbirths	317	37	354
Total	13,870	2487	16,357

TABLE 8. FETAL MORTALITY

May 25, 1931—*June* 30, 1936

	Hospital	Home Service	Total
Stillborn:			
Previable	19	9	28
Premature (Viable)	140	9	149
Full Term	158	19	177
Total	317—2.2%	37—1.4%	354—2.1%
Neonatal Death:			
Previable	27	4	31
Premature (Viable)	143	5	148
Full Term	109	12	121
Total	279—2.0%	21—0.8%	300—1.8%
Total Deaths	596—4.2%	58—2.2%	654—3.9%
Infants under 1000 Gms.	46	13	59
Corrected Total	550—3.9%	45—1.8%	595—3.6%

TABLE 9. GYNECOLOGY

MINOR GYNECOLOGIC OPERATIONS

October 1, 1929—*June* 30, 1936

	Number	Deaths
Examination under Anesthesia	34	..
Diagnostic D. & C. and/or Biopsy	945	..
Radium Insertion	245	..
Vulvo-Vaginal Procedures	103	..
Colpotomy	62	..
Vulvectomy	16	..
Trach., Perinerorrhaphy., Ant. Colp.	420	1
Repair of Fistulae	18	1
Secondary Abdominal Closure	24	..
Herniorrhaphy	11	..
Removal of Foreign Body	1	..
Total	1879	2—0.1%

TABLE 10. GYNECOLOGY

MAJOR GYNECOLOGIC OPERATIONS

October 1, 1929—*June* 30, 1936

	Number	Deaths	Per Cent
Colpocleisis with or without Vaginal Hysterectomy	45	2	4.4
Vaginal Plastic with Opening Peritoneum	51	..	..
Vaginal Hysterectomy	150	3	2.0
Incomplete Abdominal Hysterectomy	511	3	0.58
a. With removal of one adnexa	153		
b. With removal of both adnexae	196		
Complete Abdominal Hysterectomy	175	7	4.0
a. With removal of one adnexa	43		
b. With removal of both adnexae	85		
Combined Laparotomy and Plastic	42	..	..
Myomectomy	27	..	..
Operations on Tubes, Ovaries, Ligaments, Appendix	244	4	1.23
Exploratory Laparotomy	75	5	6.66
Bassett Operation	3	..	..
Total	1323	24	1.81

BRAIN PATHOLOGY and MENTAL ALIENATION

B. LEMCHEN, M. D.*

CHICAGO

Under this heading I would like to describe several mental alienations where pathological changes in the brain are either established or may reasonably be assumed to exist.

1. *Complete Amnesia.* Where a person develops a condition of his mind where he is disoriented in all spheres and may perform almost any act. It may last from a few hours to several months. From their actions and talk a good many of them hallucinate. However, when they recover they remember nothing that has transpired, not even the hallucinosis they have experienced during the amnesic state.

This condition is found sometimes in hysteria and epilepsy, more often in brain injuries and alcoholics. They were very common in moonshine users. The condition of the brain during the state of amnesia among those who have recovered, of course, is not known; but when autopsy was made on those who acted the same as those who have recovered, we found extreme edema of the brain with congestion of the cerebral vessels. One case that was struck by an automobile was brought to the Chicago State Hospital for emergency treatment. On examination the only visible injury was a discoloration of the buttock. We kept her in our place for some time because we considered her in too serious condition to be removed and her brothers also promised to have her taken to a private hospital. However, the brothers afterwards had her removed to the County Hospital where she died. She lived 16 days after the injury. The pathologist of the County Hospital told me at that time that she was posted and they found no injuries to the bony structures but the brain was lacerated in several places and there was considerable edema of the brain.

*Deceased, June 18, 1937.

2. *Delirious State.* This is a condition where a person becomes disoriented in all spheres with a vivid hallucinosis of some or all of the senses, the most common that of sight and hearing. He may perform almost any act during his delirium, but it is a reaction to his hallucinosis. After recovering from the delirium, he will have an amnesia for current events but will remember the hallucinosis he experienced during his delirium.

Delirium is commonly experienced in persons suffering from infectious diseases, either before the onset of the disease (initial delirium), during the disease (fever delirium) or after recovering from the disease (post infectious psychosis). It is also met in conditions where bodily resistance is suddenly lowered, like excessive hemorrhage, starvation, shock, sun-stroke and severe mental trauma. It is also met in intoxications like alcohol, lead, cocain and many other poisons.

The pathological conditions met in those who have died are edema of the brain and congestion of the cerebral vessels.

3. *Catatonic State.* In this state a person will suddenly become stuporous, motionless, rigid or restless, excited and very active. He may also hallucinate during his excitement. He may perform almost any act, which may be of short or long duration and when recovering will remember current events and also some of the foolish things he has performed. However, he cannot explain why he had done them.

Their acts generally have no relation to their hallucinosis, although sometimes they refuse food on account of voices that tell them not to eat. This condition is commonly met in demetia praecox. It is also met in toxemias and I have seen them in alcoholics. I have seen one case in a woman who had two attacks, the first at 53 years and the other at 58 years, which were undoubtedly due to arteriosclerosis. They seldom die early in the attack and there are few post mortem studies. In the few autopsies I have seen the most characteristic findings were in the heart. The heart was soft, flabby and somewhat congested, suggesting an acute myocarditis, and the cerebral vessels were congested.

4. *Confusional State* is a condition where a person becomes dazed. He is only partially oriented. He may recognize people but cannot tell time. Some of them, when they are at the hospital, will recognize the fact that they are not at home but could not tell the nature of the place, even after seeing nurses in their uniforms and doctors examining them, nor could they tell how and why they came to the hospital. After telling them that they are in a hospital and why they came, they will recognize the fact but soon forget it. They will carry out commands if they understand what is wanted of them. They may or may not hallucinate, if they do, as a rule they do not react to them. This condition is generally found in toxemias, especially in morphine, chloral, bromide and veronal poisoning. In the last three we may also have physical findings resembling general paralysis but as a rule they recover rapidly.

Confusional states are also met in infectious and post infectious conditions. We had a young woman at the Chicago State hospital who, nine days after a normal delivery and doing well for nine days, developed a condition resembling a confusional state and has completely recovered in three weeks. Confusional states are also met in the beginning of dementia praecox. Persons suffering from confusional states seldom die during the acute stage and very few pathological studies were made.

5. *Bewildered State* is a condition where a person develops a condition where he looks bewildered and fearful. He generally wanders around the ward aimlessly, seldom speaks spontaneously but as a rule he does not bother any one and when spoken to does not answer readily but correctly, if at all. As a rule they also hallucinate but seldom react to them. This condition is generally met in the beginning of dementia praecox. They seldom die in the acute attack and very little pathology of this condition is known.

6. *Korsakoff's Syndrome* is a condition where a person develops a marked memory defect and tries to fill in the defect with events he has experienced during his life commonly known as fabrication of memory. It is a condition where a person will tell you of many activities or experiences which happened to him that day or previous days but which did not actually happen. The person himself actually believes in the happening and he is not trying to lie. It is generally met with in polyneuritis due to toximias like alcohol, lead, etc. But it is also met

without polyneuritis in other conditions like senility or general paralysis. As Korsakoff's syndrome is met only with other forms of mental diseases and is not an entity, the pathological study is that of the disease itself, of which it is the syndrome.

7. *Demented States.* Almost everyone understands the word dementia. It is derived from dement—out of mind, and it is used in regard to persons who decline in mental faculties with memory loss or poor reasoning power to complete disorientation. It is generally met in general paralysis, senility, arterio-sclerosis and the terminal stages of chronic alcoholism and in some of the dementia praecox group.

The pathological condition of general paralysis is fairly well known. It is a degeneration of the brain cells and infiltration of the cerebral vessels with round cells, plasma cells, etc. *Cerebral Arteriosclerosis:* The name itself tells its pathology. In senility, in addition to the atrophy found in the brain, changes in the cerebral vessels are always found.

In conclusion I may say, in all those cases, where post mortem studies were made, changes in the cardiovascular system were found. Adding psychosis met in vascular syphilis and the bluish discoloration of the extremities together with edema of the feet, that is so commonly met in dementia praecox cases, changes in the cardiovascular system undoubtedly play quite a role in the causes of insanity. The old saying "that a man is as old as his arteries" is just as true with the mind as it is with the body.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting, Wednesday, December 15, 1937

SYMPOSIUM ON UNDULANT FEVER

The History, Epidemiology and Pathology of Undulant Fever. William H. Holmes

The Symptomatology, the Clinical and Serological Diagnosis and Treatment of Undulant Fever. James G. Carr

The Veterinary Aspects of Undulant Fever. J. M. Buck, Animal Diseases Station, Beltsville, Maryland.

The Occupational Hazards of Undulant Fever. W. H. Lipman.

Discussion, Robert W. Keeton, C. Philip Miller.

Marriages

MELVIN REESE GUTTMAN to Miss Eleanor Given, both of Chicago, December 5.

CHARLES OTTO REINHARDT, Mascoutah, Ill., to Miss Agnes Potasik of Lincoln, in Chicago, September 18.

PAUL M. RICE, Chicago, to Miss Mary M. Gardner of Baltimore, May 12, at Santa Fe, N. M.

EDWIN R. TALBOT, Joliet, Ill., to Miss Dorothy Constance Hoyt at Miami Beach, Fla., October 15.

Personals

Dr. Don C. Sutton addressed the Colorado Post-Graduate Assembly in Denver, December 15 on "Obscure Fevers, Rheumatic Heart Disease and Arteriosclerosis."

Dr. O. E. Van Alyea read a paper at the Cleveland Clinic, Cleveland, Ohio, December 9, on "The Frontal Sinus, Anatomic and Clinical Considerations."

Dr. Eric Oldberg addressed the Macon County Medical Society at Decatur, December 21, on the subject, "Signs and Symptoms of Surgical Lesions of the Spinal Cord."

Dr. D. A. Horner gave a talk on "Home Versus Hospital Deliveries" before the Hancock County Medical Society at Carthage, December 6.

Dr. Leon Unger gave a paper on "Eczema in Children" before the Scott County Medical Society of Iowa at Davenport, December 7.

Dr. F. E. Senear gave a talk on "Diagnosis and Treatment of Early Syphilis" before the Will-Grundy County Medical Society at Joliet, December 8.

Dr. Willliam J. Pickett gave a paper on "Thyroid Surgery" at Rantoul before the Champaign County Medical Society, December 9.

Dr. Arthur F. Abt gave a talk on "Preventive Methods for Contagious Diseases," before the Will-Grundy County Medical Society, at Joliet, December 1.

Dr. Alfred D. Biggs gave a talk on "The Premature Infant," before the members of the Lee and Whiteside County Medical Societies at Dixon, December 2.

Dr. James H. Wallace and Joseph L. Baer presented papers on "The Rheumatic Heart in Children," and "Contraindications to Cesarian Section," before the Doctors of Union, Perry and Jackson Counties, December 2.

Dr. W. B. Serbin gave a paper on "Repair of Obstetric Injuries," before the doctors of Coles-Cumberland County Medical Society at Mattoon, December 2.

Dr. James E. Lebensohn addressed the Rock River Valley Eye, Ear, Nose and Throat Society at Rockford, Ill., Dec. 17, on "Refinements of Refraction."

Dr. Joseph L. Baer addressed the Tri-county Society Meeting at Pinkneyville, Illinois, December 2, 1937, on "Contra Indications to Cesarean Section"

Doctor Kretschmer went to Denver to conduct a clinic, December 17, on diseases of the Prostate and their treatment and read a paper on Malignant Tumors of the Kidney in children and adults at the Post Graduate meeting of the Colorado State Medical Society held in Denver.

The Past Presidents of the Aux Plaines Branch are planning to honor Dr. Mary Jeannette Kearsley, 5652 Race Avenue, Chicago, Illinois, who has been in active practice 50 years, by giving a banquet at the Oak Park Arms Hotel, Washington Boulevard and Oak Park Avenue, January 19, 1938. A number of her classmates in College and Cook County Hospital are expected to be present to felicitate Dr. Kearsley. Dr. Fishbein will be the speaker.

Dr. Kearsley was the first and only woman to be elected president of the Aux Plaines Branch, an honor few women are privileged to enjoy.

The past presidents hope as many of the Aux Plaines members as can will attend and help celebrate this auspicious occasion.

Dr. Lee C. Gatewood, Chicago, discussed "Gastric and Duodenal Ulcer" before the Will-Grundy County Medical Society at Joliet, November 24.

Dr. Russell M. Wilder, Rochester, Minn., discussed "Pathogenesis and Etiology of Diabetes" at a meeting of the North Side branch, December 2.

At a meeting of the Evanston branch December 2, the speakers included Dr. Budd C. Corbus on "A Serological Control of Neisserian Infections with the Bouillon Filtrate."

The Chicago Orthopedic Society was addressed December 10, among others, by Dr. Ralph K. Ghormley, Rochester, Minn., on "Some Unusual Lesions of Vertebrae."

Dr. Solomon Strouse, formerly of Chicago, has been appointed associate clinical professor of medicine at the University of Southern California Medical School, Los Angeles.

Dr. Walter H. Baer, Peoria, discussed "Shock Therapy of Schizophrenia: The Use of Insulin and Metrazol" before the Sangamon County Medical Society in Springfield, December 2.

At a meeting of the Society of Medical History of Chicago, November 30, Drs. Clarence A. Earle, Des Plaines, Ill., discussed "Pioneer Medicine" and William Allen Pusey, "Giants of Medicine in Pioneer Kentucky."

Dr. Walter C. Alvarez, Rochester, Minn., addressed a joint meeting of the Englewood and Stock Yards branches of the Chicago Medical Society December 7; "The Care of the Aged."

Dr. Arthur E. Lord, Plano, surgeon general, Illinois National Guard, was guest of honor at a dinner in Chicago, November 17, marking his election as president of the Association of Military Surgeons of the United States.

The Du Page County Medical Society was addressed in Elmhurst November 17 by Drs. Roland P. Mackay on "Treatment of Neurosyphilis" and Eric Oldberg on "Surgical Treatment of the Complications of Neurosyphilis"; both are of Chicago.

Dr. Max Thorek has been made an Honorary Member of the Surgical Society of the University of Sofia, Bulgaria.

Drs. William H. Browne and Julius H. Hess present the scientific program before the North Shore branch December 7; their subjects "Prevention and Management of Premature Labor," and "Care of Premature Babies" respectively.

At a meeting of the medical societies of Lee and Whiteside counties in Sterling, November 18, Drs. Philip H. Smith, Evanston, Ill., and Raymond F. Grisson, Chicago, spoke on "Contraindication of Cesarean Section, Prevention and Treatment of Abortion" and on "Treatment of Infectious Diseases" respectively.

News Notes

—Six cases of smallpox were discovered in the Roseland district, December 11, according to the Chicago Tribune. Four of the patients were

members of one family and the other two were neighbors. None of the patients have been vaccinated successfully, it was stated. These are the first cases of smallpox reported in the city since April.

—The public health units in Champaign and Urbana have been combined in a new health district, replacing the former separate health activities in the two townships. Dr. G. Howard Gowen has resigned as assistant to the chief, division of communicable diseases, state department of health, Springfield, to direct the new unit, effective December 6.

—The Chicago Tuberculosis Institute and the Municipal Tuberculosis Sanitarium are sponsoring a traveling x-ray unit to combat tuberculosis among school children in Chicago. The unit was put into service at the Spalding School for Crippled Children recently. It contains dressing rooms and equipment for taking 400 x-ray plates a day and will be moved from school to school, newspapers reported.

—The new building containing the medical and dental laboratories of the University of Illinois has been completed and occupied. The new unit is of red brick collegiate gothic and cost $1,550,000. Seven of the fifteen floors are devoted to the medical facilities and the rest of the dental clinics. The building connects through corridors with a similar unit entirely occupied by the medical school and with the Illinois Research and Educational Hospital, which supplies the patients and nurses. New equipment includes a biplane fluoroscope. A cancer clinic is to be started in lead lined rooms in the basement with $300,000 already appropriated for radium and equipment, it is reported. Dr. David J. Davis is dean of the medical school; Frederick B. Noyes, D.D.S., of the dental school, and Dr. Major H. Worthington is in charge of the research and educational hospital.

—Dr. Charles K. Petter of the staff of the Glen Lake Sanatorium, Oak Terrace, Minn., has been appointed director and supervisor of the Lake County Tuberculosis Sanatorium shortly to be erected. He will take office about January 1. The voters of the county approved at the November, 1936, election a proposition to build a tuberculosis sanatorium with tax revenue to be collected over a period of ten years starting next summer, newspapers report.

—The annual state conference on public health held in Springfield, December 9-10, under the auspices of the state department of public health. The speakers included:

Dr. Philip C. Jeans, Iowa City, Nutritional Deficiency in Public Health.

Herbert F. Moore, ScD., Urbana, Social Engineering in the Health Field.

Dr. Frederick T. Lord, Boston, Lobar Pneumonia and Serum Therapy.

Dr. Julius Levy, Newark, N. J., Preventive Mental Hygiene.

Dr. Irving S. Cutter, Chicago, Education in Preventive Medicine.

Dr. Don W. Gudakunst, Detroit, Newer Trends in School Health Practice.

Dr. Charles F. McKhann, Boston, Preventing Hospital Infections.

Dr. David C. Elliott, Hagestown, Md., A Venereal Disease Program.

Dr. Paul H. Harmon, Springfield, Epidemiology of Poliomyelitis.

Dr. Guy Howard Gowen, Springfield, Trailer Laboratory in Typhoid Control.

—A fund of more than $500,000 has been established for cancer research and investigation, the income of which will be used in Passavant Hospital. The institute will be known as the Patterson Institute for Cancer Research. Miss Edith Patterson, Sterling, Ill., is the donor in memory of her brother, Floyd Elroy Patterson, who died in 1928. Under the term of the agreement between Miss Patterson, Northwestern University and the hospital, the building occupied by the Passavant Hospital will be named the Floyd Elroy Patterson Building, although the unit will continue to be known as the Passavant Hospital, it was announced. The institute will be organized as a department of the hospital with a yearly appropriation of $12,000 for treatment and research.

Deaths

Edwin Melville Adams, Gridley, Ill.; Barnes Medical College, St. Louis, 1901; a Fellow, A. M. A.; aged 60; on the staffs of St. Joseph Hospital and the Mennonite Hospital, Bloomington, where he died, September 26, of cerebral hemorrhage.

Amos D. Bates, Camp Point, Ill.; Chicago Medical College, 1882; member of the Illinois State Medical Society; aged 82; died, September 6, at St. Margaret's

Hospital, Spring Valley, of hypostatic pneumonia as a result of a fall and fracture of the right leg.

SIMON P. BERNS, Willow Hill, Ill.; Missouri Medical College, St. Louis, 1881; aged 78; died, September 24.

JOHN WILLIAM BERRYMAN, Scottville, Ill.; Keokuk (Ia.) Medical College, College of Physicians and Surgeons, 1902; aged 77; died, October 17, of carcinoma of the stomach.

ARTHUR DAVENPORT BLACK, Chicago; Northwestern University Dental School, Chicago, 1900; a Fellow, A. M. A., Northwestern University Medical School, Chicago, 1901; for twenty years dean of the Northwestern Dental School, and a member of the faculty since 1900, as professor of oral surgery, operative dentistry and oral pathology; a director of the Chicago Tuberculosis Institute; fellow of the American College of Surgeons; was an honorary member of scientific societies in America and abroad, including the Royal Society of Medicine of England, the German Academy of Natural Sciences and the Swedish Dental Society; past president of the Illinois State Dental Society, the American Institute of Dental Teachers and the International Association for Dental Research and served for several years on the National Research Council; in 1933 president of the Chicago Centennial Dental Congress; during the World War was advisor to the Surgeon General of the Army, in Washington; for twelve years served on the staff of St. Luke's Hospital; was the author of the "Index of Periodical Dental Literature," consisting of thirteen volumes; author and editor of four volumes of G. V. Black's work on "Operative Dentistry"; aged 67; died, December 7, in the Swedish Covenant Hospital, of myelogenous leukemia.

EDWIN L. CLARK, Rockford, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1883; aged 88; died, October 21, of senility.

WILLIAM R. DALE, Sumner, Ill.; University of Louisville (Ky.) Medical Department, 1877; aged 83; died, September 22, of coronary thrombosis.

YEPROS MARTIN DODDOKYAN, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; member of the Illinois State Medical Society; aged 62; died, October 16, of mitral insufficiency, chronic nephritis and arteriosclerosis.

HAYDN LYLE FISCHER, Ottawa, Ill.; Northwestern University Medical School, Chicago, 1909; member of the Illinois State Medical Society; served during the World War; past president of the Henry County Medical Society; aged 53; died suddenly, September 4, of angina pectoris.

CHARLES FREDERICK FRIEND, Chicago; Hering Medical College, Chicago, 1895; member of the Illinois State Medical Society; formerly a medical missionary in Africa; on the staff of the Evangelical Hospital; aged 72; died, October 2, of carcinoma of the gallbladder and acute pancreatitis.

RALPH ALLISON GOODNER, Anna, Ill.; Rush Medical College, Chicago, 1888; Jefferson Medical College of Philadelphia, 1891; medical superintendent and managing officer of the Anna State Hospital; aged 72; died, September 19, of enteritis and chronic myocarditis.

THOMAS HENRY HALL, Brighton, Ill.; Rush Medical College, Chicago, 1884; member of the Illinois State Medical Society; formerly mayor, and member of the board of health; aged 77; died, September 10, of sarcoma of the pelvic bones with metastasis to lungs and other organs.

DON H. HINCKLEY, Chicago; Jenner Medical College, Chicago, 1909; aged 59; died, September 5, in the Victory Memorial Hospital, Waukegan, Ill., of injuries received in a fall from a tree.

LUDWIG FREDERICK HOOGE, Chicago; Chicago Homeopathic Medical College, 1889; a Fellow, A. M. A.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; aged 73; on the staff of the South Shore Hospital, where he died, October 7, of coronary thrombosis.

JAMES MANUEL JOHNSON, McLeansboro, Ill.; University of Illinois College of Medicine, Chicago, 1930; a Fellow, A. M. A.; aged 35; died, September 24, in the Barnes Hospital, St. Louis, of infantile paralysis.

SOLOMON JONES, Danville, Ill.; Illinois Medical College, Chicago, 1902; a Fellow, A. M. A.; past president and secretary of the Vermilion County Medical Society; past president of the Aesculapian Medical Society of the Wabash Valley; fellow of the American College of Surgeons; formerly member of the city board of education; on the staff of the Lake View Hospital; aged 65; died, September 25, of cerebral hemorrhage.

CYRIL JAMES LARKIN, Chicago; University of Illinois College of Medicine, Chicago, 1915; member of the Illinois State Medical Society; assistant clinical professor of surgery, Loyola University School of Medicine; fellow of the American College of Surgeons; on the staff of the Mercy Hospital; aged 45; died, September 3, at St. Agnes Hospital, Fond Du Lac, Wis., of injuries received in an automobile accident.

SOLOMON OLIVER MAYERSON, Chicago; Loyola University School of Medicine, Chicago, 1921; aged 48; died, September 2, of cerebral vascular hemorrhage.

GEORGE ALBERT MCDONALD, Fairfield, Ill.; Hahnemann Medical College and Hospital, Chicago, 1895; aged 72; died, September 28, of acute endocarditis.

WILLIAM B. MCINTOSH, Colfax, Ill.; Barnes Medical College, St. Louis, 1895; aged 71; died, September 8, of carcinoma of the prostate.

JOHN WASHINGTON MEEK, Chicago; Rush Medical College, Chicago, 1881; aged 78; was found dead, September 17, of gunshot wounds of the head.

FREDERICK SUMNER SELBY, Chicago; Rush Medical College, Chicago, 1893; a Fellow, A. M. A.; aged 65; on the staff of the Garfield Hospital, where he died, September 27, of empyema of the gallbladder and chronic myocarditis.

OTMAR THURLIMANN, Harvey Ill.; Rush Medical College, Chicago, 1925; member of the Illinois State Medical Society; aged 37; died, September 14, in a hospital at Duluth, Minn., of streptococcic meningitis.

OSCAR D. WHALIN, Chicago; Rush Medical College, Chicago, 1890; aged 71; died suddenly, September 12, of cerebral hemorrhage and arteriosclerosis.

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